

PCON-Y18-LP

Automatic Low Pressure Calibrator

PRESYS

www.presys.com.br



Field Service
version



Desktop
version



Rack Mounting
version

Technical Manual

EM0345-02

**WARNING!**

The instruments described in this technical manual are equipments for use in specialized technical area. The user is responsible for the configuration and selection of values of the parameters of the instruments. The manufacturer warns against the risk of incidents with injuries to both persons and property, resulting from the incorrect use of the instrument. Use the instrument only according to this technical manual. Any operation not described here is not allowed.

**WARNING!**

Other pressure equipments and accessories (such as hose, reservoirs, protection devices) connected to the calibrator must be appropriate to the working pressure.

**WARNING!**

During startup, do not connect any instrument to the output port of the Pressure Control Module. Before making connections to the Pressure Control Module, enter the CALIBRATOR menu and wait for the automatic VENT and RESET operation.

**WARNING!**

The calibrator discharges gas to the atmosphere through the vent port. Leave this port free.

**WARNING!**

Before connecting the instrument under test to the output port, make a VENT operation to discharge any gas inside the controller.

**WARNING!**

Before connecting the instrument under test to the output port it is recommended to configure the output range parameters. These parameters limit the controller output range, in order to protect the instrument under test.

**ATTENTION!**

To prevent damage to the connected instrument to be calibrated, do not turn off the PCON-Y18-LP with the CONTROL mode selected. Before turning off, select MEASURE or VENT mode.

**WARNING!**

Avoid electric shock risk when touching the equipment. Use only suitable power cable with earth connection and never power up the equipment to the mains socket without an earth connection (DT and RM Version). For FS Version, use only the charger provided by the manufacturer.

**WARNING!**

High voltage is present inside these equipments. It can cause great damages and injuries. Do not make any repair service inside the equipment without removing the plug from the supply (DT and RM version).

**NOTICE!**

High level of electromagnetic noise can cause instability to the equipment. The equipment is provided with electromagnetic interference filters that protect not only the mains but also the equipment itself against noise. These filters have no function if the unit/charger is not earthed properly.

**IMPORTANT!**

All pressure equipment and accessories (such as hoses, connections, adapters, etc.) connected to the calibrator must be clean, free of residues such as oil, dirt, dust etc. These residues can cause irreversible damage to the internal system of the pressure control module. It is mandatory to use filters in out port (HI).

**ATTENTION!**

Whenever you change the inclination of the PCON-Y18-LP, it is important to perform the RESET operation of the pressure again.

CAUTION: Damage caused by failure to observe the above recommendations results in total or partial loss of the equipment warranty.

Do you have any doubt?

Press **HELP** or  icons to have information about the function.

The warranty conditions are available in our sites:

www.presys.com.br/warranty

EC Declaration of Conformity

We declare under our sole responsibility that the CE marked products, are in conformity with the essential requirements of the following EC Directives when installed in accordance with the installation instructions contained in the product documentation:

Series	PCON-Y18-LP
Description	Automatic Low Pressure Calibrator
LVD Low Voltage Directive	2014/35/EC of the European Parliament and of the Council of 12 December 2006 on the harmonization of the laws of Member States relating to Electrical Equipment designed for use within certain voltage limits.
EN 61010-1:2011	Safety requirements for electrical equipment for measurement, control and laboratory use
EN 61010-2:010	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-010: Particular requirements for laboratory equipment for the heating of Materials.
EMC directive	2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC
EN 61326-1:2003	Electrical equipment for measurement, control and laboratory use - EMC requirements

São Paulo, 8 September 2015



	
Vinicius José Gomes Nunes CEO	Antonio Rafael Sito Antunes Engineering Manager

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1 - Introduction

1.1. General Description

The **PCON-Y18-LP Automatic Low Pressure Calibrator** enables the control of pneumatic low pressure from -100 to 100 Pa up to -35000 to 35000 Pa. Due to its integrated electrical pump, there is no need of a pressure supply, providing a complete solution for the test and calibration of low pressure and differential gauges, transmitters and switches.

It has a high level of accuracy, including aspects relating to changes in room temperature, and it maintains the specifications over long periods of time. Besides that, it also allows the measurement of signals generated by the instrument under test which is being calibrated. This is possible due to an **embedded calibrator** specific for these types of signal, including current 4-20 mA. Thus, PCON-Y18-LP incorporates the functions of pressure controller, digital pressure standard and calibrator for mA, V, mV, ohms and RTD.

It is also a **Hart® Communicator** (optional) with a configurable internal resistance, transmitter power supply and latest DD as optional, in order to easily configure and calibrate Hart® pressure transmitters.

A highly visible **5.7" touch screen display** allows easy configuration and user-friendly operation.

PCON-Y18-LP features **full advanced documenting capabilities**. It enables the creation and execution of automatic calibration procedures (Tasks). After completing a task, a Calibration Report is issued and it can be printed directly on a USB connected printer or a PDF document can be generated.

Communication with the computer through **SCPI commands** for on-line data acquisition and control of the calibrator.

1.2. Technical Specifications

1.2.1. Pressure Control Module

Choose one range for the Pressure Control Module between -100 to 100 Pa (-1 to 1 mbar) and -35000 to 35000 Pa (-350 to 350 mbar).

SI-Pascal	bar	Resolution	Control Stability	Accuracy
(0) -100 to 100 Pa	-1 to 1 mbar	0.001 Pa	1000 ppm ± 0.1 Pa	± 0.50 % FS*
(1) -1000 to 1000 Pa	-10 to 10 mbar	0.01 Pa	100 ppm ± 0.1 Pa	± 0.075 % FS
(2) -2500 to 2500 Pa	-25 to 25 mbar	0.01 Pa	100 ppm ± 0.25 Pa	± 0.050 % FS
(3) -7000 to 7000 Pa	-70 to 70 mbar	0.1 Pa	40 ppm ± 0.28 Pa	± 0.025 % FS
(4) -35000 to 35000 Pa	-350 to 350 mbar	1 Pa	40 ppm ± 1.4 Pa	± 0.025 % FS

(*) FS = Full Scale.

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.005 % FS / °C, taking 23 °C as the reference temperature. These values are obtained through algorithms of temperature compensation on pressure measurements.

1.2.2. Auxiliary Input

Input Ranges	Resolution	Accuracy	Remarks
millivolt -150 mV to 150 mV -500 mV to -150 mV 150 mV to 2450 mV	0.001 mV	± 0.01 % FS*	R _{input} > 10 MΩ auto-ranging
	0.01 mV	± 0.02 % FS	
	0.01 mV	± 0.02 % FS	
volt -10 V to 11 V 11 V to 45 V	0.0001 V	± 0.02 % FS	R _{input} > 1 MΩ
	0.0001 V	± 0.02 % FS	
mA -5 mA to 24.5 mA	0.0001 mA	± 0.02 % FS	R _{input} < 120 Ω
resistance 0 to 400 Ω 400 to 2500 Ω	0.01 Ω	± 0.01 % FS	Excitation current 0.85 mA, auto-ranging
	0.01 Ω	± 0.03 % FS	
Pt-100 -200 to 850 °C -328 to 1562 °F	0.01 °C	± 0.1 °C	IEC 60751
	0.01 °F	± 0.2 °F	
Pt-1000 -200 to 400 °C -328 to 752 °F	0.1 °C	± 0.1 °C	IEC 60751
	0.1 °F	± 0.2 °F	
Cu-10 -200 to 260 °C -328 to 500 °F	0.1 °C	± 2.0 °C	Minco 16-9
	0.1 °F	± 4.0 °F	
Ni-100 -60 to 250 °C -76 to 482 °F	0.1 °C	± 0.2 °C	DIN-43760
	0.1 °F	± 0.4 °F	

(*) FS = Full Scale.

Accuracy values are valid within one year and temperature range from 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as the reference temperature.

1.2.3. General Specifications

Thirty minutes warm-up time.

Transmitter power supply (TPS): 24 Vdc, with protection from short circuit (30 mA).

Contact input for calibration of pressure switches.

Operating temperature range: 0 to 50 °C.

Relative Humidity: 0 to 90 % RH.

Engineering units – psi, bar, mbar, MPa, kPa, Pa, atm, at, mmH₂O, cmH₂O, ftH₂O, inH₂O, inH₂O@60°F, torr, mmHg, cmHg, inHg, inHg@60°F, gf/cm², kgf/cm², kgf/m² (see section 4 – Pressure Units Conversion).

Temperature: °C, °F, K, °R.

Built in Web Server.

Ethernet communication. USB port for software/firmware upgrade.

HART[®] Communication Protocol (optional).

Includes technical manual and test leads. For FS Version (Field Service) a battery charger is also included (100 to 240 Vac 50/60Hz).

Pneumatic Connection: connector for hose diameter 6 mm.

DT and RM Version: Power Supply: 100 to 240 Vac 50/60Hz

FS Version: Lithium Polymer 4200 mAh rechargeable battery.

Dimensions: 135 mm x 350 mm x 270 mm (HxWxD) - DT Version – Desktop.

132 mm x 483 mm x 255 mm (HxWxD) - RM Version – Rack Mounting.

200 mm x 300 mm x 260 mm (HxWxD) - FS Version – Field Service

Weight: 6.2 kg approx. (DT Version – Desktop)

8.5 kg approx. (RM Version – Rack Mounting)

6.0 kg approx. (FS Version – Field Service)

One-year warranty.

Calibration Certificate (optional).

Notes:

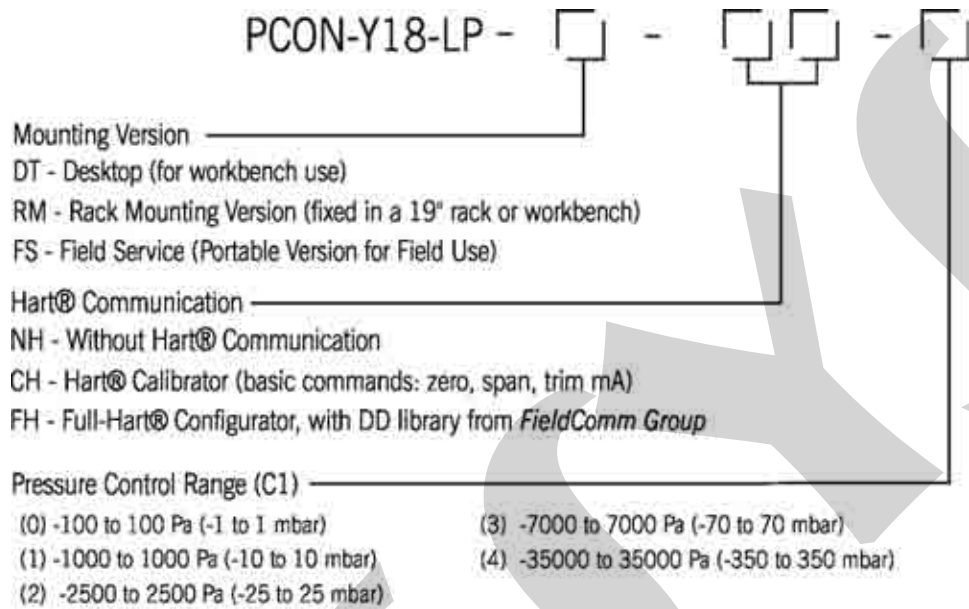
* Changes can be introduced in the instrument, altering specifications in this manual.

* HART[®] is a *FieldComm Group* trademark.

1.3. Special Software Features

- **PRESET POINTS:** edit your most frequently used setpoints and access them quickly.
- **STEP:** steps or setpoints with configurable time.
- **STABILITY/LEAK TEST:** measures the variation of the signal (be it Pressure or an Auxiliary Input signal) within a configurable period.
- **PRESSURE SWITCH TEST:** automatic testing of pressure switches.
- **AUTOMATED TASKS:** create calibration work orders and automatic execution of calibration services, storage of data and generation of calibration report to a directly connected USB printer or PDF file.
- **DATA LOGGER:** monitoring of input or output signals, storage and visualization of data in chart or table.
- **VIDEOS:** storage and viewing videos on the calibrator screen.
- **MEMORY MANAGER:** stores configuration types predefined by the user.

1.4. Order Code



See specifications for each range in section 1.2.1 of this manual.

1.5. Parts Identification

DT Version - Desktop

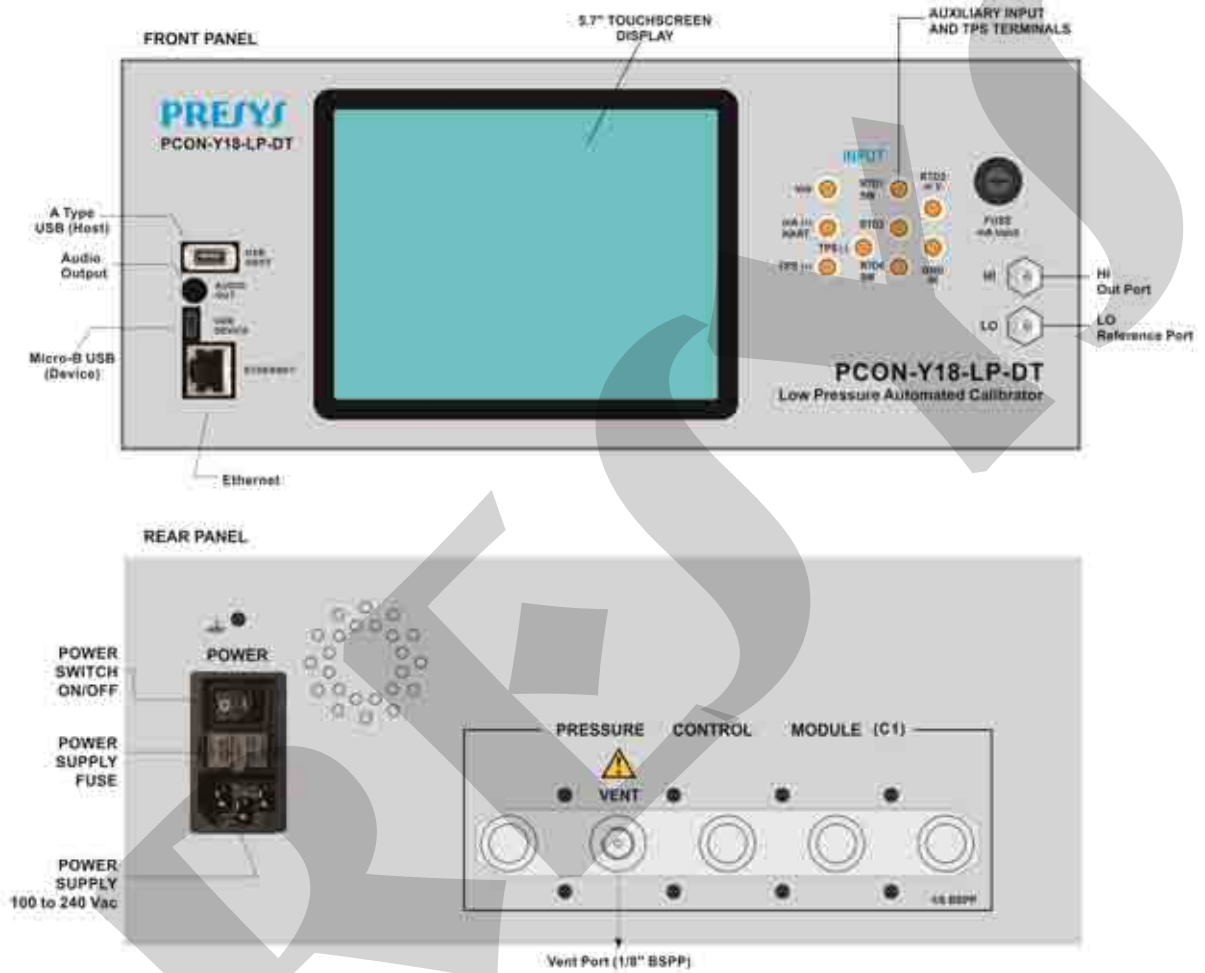


Fig. 01 – DT Version

RM Version – Rack Mounting

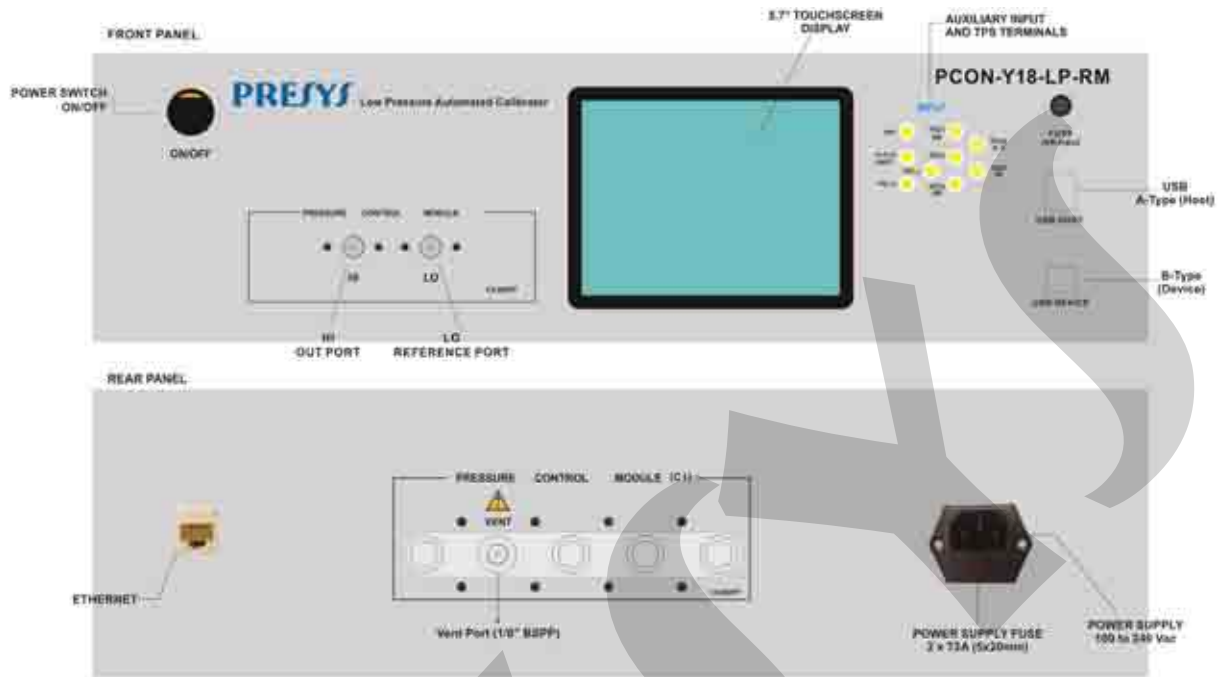


Fig. 02 – RM Version



Fig. 03 – FS Version

Notes:

On the FS Version, the VENT is an internal port, not accessible to the user.

2 - Calibrator Operation

Turn on the PCON-Y18-LP by pressing the power switch (located on the rear panel for the DT version, and on the front panel for the RM and FS version).

When powered on, the calibrator goes through a self-test routine. In case of failure, it displays a message to indicate the error; if that occurs, please contact the Presys Technical Assistance department.

After the self-test is completed, the display shows the main menu, as showed below.



Fig. 04 - Main Menu



WARNING!

During startup, do not connect any instrument to the output port of the Pressure Control Module. Before making connections to the Pressure Control Module, enter the CALIBRATOR menu and wait for the automatic VENT and RESET operation.

The main menu is divided in the following functions:

CALIBRATOR – selects the input/output functions (Pressure Control Module and Auxiliary Input Signals), see section 2.1.

HART[®] – optional module that allows communication with devices that have Hart[®] Communication Protocol, see section 2.2.

TASKS – performs calibrations automatically, see section 2.3.

DATA LOGGER – record measurements, enabling visualization on chart or table, see section 2.4.

VIDEOS – features videos made by Presys to assist in the use of the calibrator, and can also store videos made by the user, see section 2.5.

SETTINGS – general instrument settings, see section 2.6.

2.1. Calibrator Menu

To select the **Pressure Control Module** and the **Auxiliary Input** functions press the **CALIBRATOR** button from the main menu.

When first entering the **CALIBRATOR** menu, the PCON-Y18-LP executes a **VENT** operation and an **AUTO RESET** of the pressure read in the Pressure Control Module. When it is done, it goes to **CONTROL** mode. The following screens are displayed.

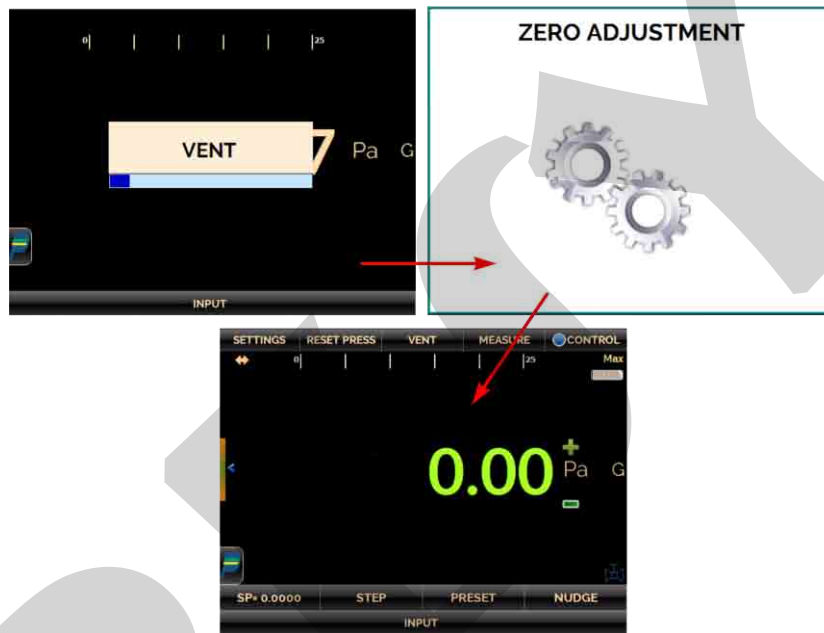


Fig. 05 - Calibrator initialization

The Pressure Control Module has three operation modes: **MEASURE**, **VENT** and **CONTROL** (see sections 2.1.2, 2.1.3 and 2.1.4). To select an operation mode, press one of the buttons indicated below. The current state is indicated by the ● symbol.



Fig. 06 - Pressure Control Module - Operation Modes

2.1.1. Pressure Control Module – Connections

PCON-Y18-LP controls the pressure in the output port with high precision and stability. To control the pressure, an integrated electric pump for positive and negative pressure generation supplies the pressure for the controller. When the calibrator is switched on, the electric pump is turned on and provides the required pressure for the entire range of the calibrator.

The presence of water, oil or particles in the pressure control module can cause irreparable damage to the system. Equipment and connections must be clean and dry when connected to output. The use of impurities filters is necessary to protect the system.

FRONT PANEL CONNECTIONS

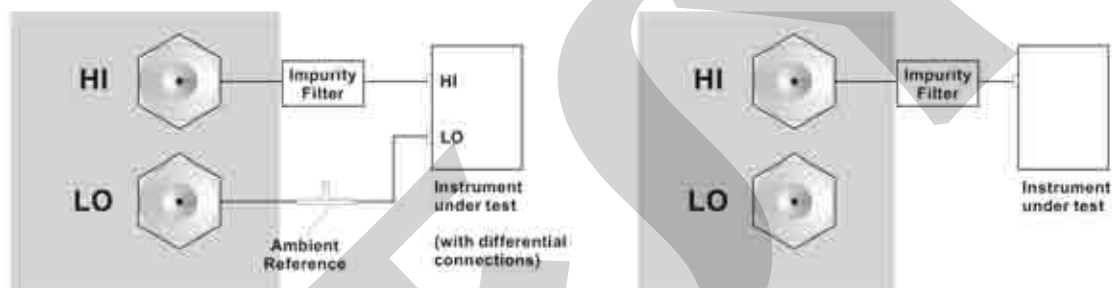


Fig. 07 - Pressure Control Module

REAR PANEL

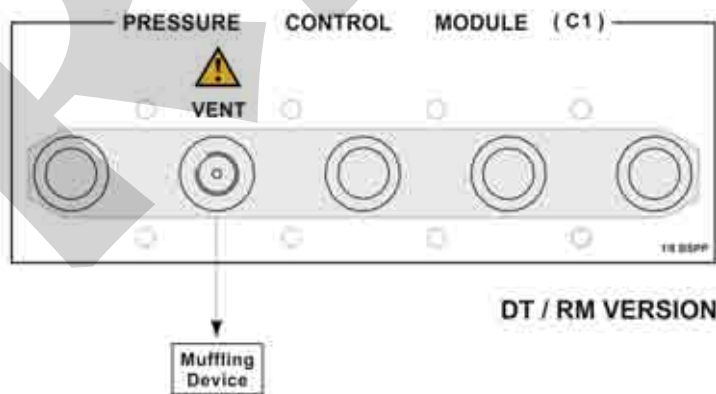


Fig. 08 – Output Connections (Rear Panel – Dt / RM Version)

- For the RM and DT version, the VENT port is located on the rear panel; HI and LO ports (Pressure output) are located on the front panel.
- For the FS version, HI and LO ports (Pressure output) are located on the front panel; VENT port is an internal port (not accessible by the user).

**WARNING!**

The instruments described in this technical manual are equipments for use in specialized technical area. The user is responsible for the configuration and selection of values of the parameters of the instruments. The manufacturer warns against the risk of incidents with injuries to both persons and property, resulting from the incorrect use of the instrument. Use the instrument only according to this technical manual. Any operation not described here is not allowed.

**WARNING!**

Other pressure equipments and accessories (such as hose, reservoirs, protection devices) connected to the calibrator must be appropriate to the working pressure.

**WARNING!**

The calibrator discharges gas to the atmosphere through vent port. Leave this port free.

**WARNING!**

Before connecting the instrument under test to the output port, make a VENT operation to discharge any gas inside the controller. Before turning the calibrator off, it is recommended to vent the gas inside the controller.

**ATTENTION!**

To prevent damage to the connected instrument to be calibrated, do not turn off the PCON-Y18-LP with the CONTROL mode selected. Before turning off, select MEASURE or VENT mode.

**IMPORTANT!**

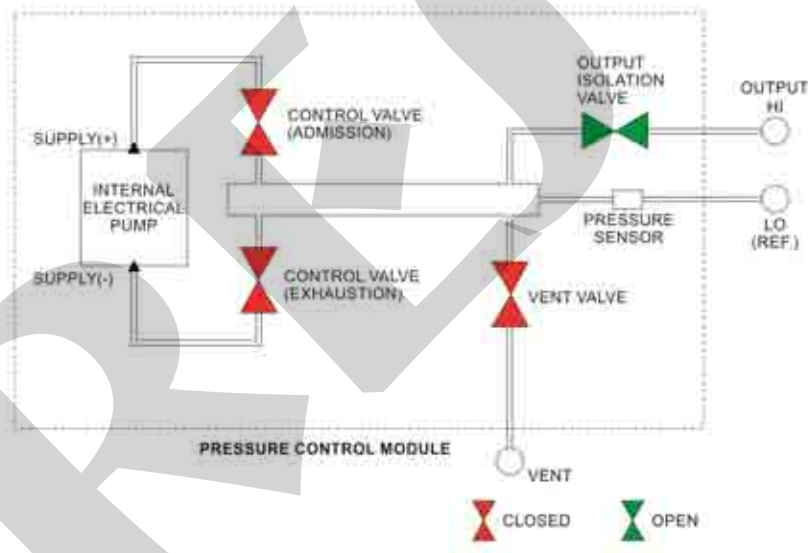
All pressure equipment and accessories (such as hoses, connections, adapters, etc.) connected to the calibrator must be clean, free of residues such as oil, dirt, dust etc. These residues can cause irreversible damage to the internal system of the pressure control module. It is mandatory to use filters in out port (HI).

2.1.2. Measure Mode

In Measure mode, the calibrator shows the pressure measurement in the Control Module. In this state, the control mode is disabled.



Fig. 09 - Measure mode – screen



Note: The FS Version (Field Service) has an internal VENT port, not accessible to the user.

Fig. 10 - Measure mode – state of the valves

The state of the output isolation valve is user configurable. To change the state of the valve, press the **SETTINGS** button shown below and change the **Output Parameters** (OPEN / CLOSED) in the **ADVANCED** tab.


The valve symbol  appears on the calibrator screen indicating that the Isolation valve is **OPEN**. This valve is used to isolate the unit under test from the pressure control module.



Fig. 11 - Output Isolation Valve Status

To zero the current pressure measurement, press the **RESET PRESS** button. Whenever this function is used, the PCON-Y18-LP executes a **VENT** operation and an **AUTO RESET** of the pressure read in the Pressure Control Module and returns to the control mode.

*ATTENTION: Whenever you change the inclination of the PCON-Y18-LP, it is important to perform the **RESET** operation of the pressure again.*



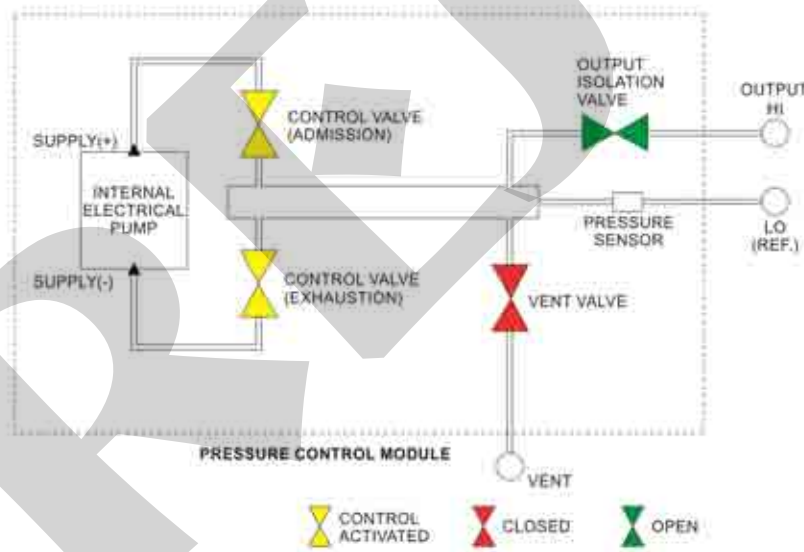
Fig. 12 - Reset of the current pressure measurement

2.1.3. Control Mode

In this mode, the calibrator controls pressure at the output port through the admission and exhaustion control valves.



Fig. 13 - Control mode – screen



Note: The FS Version (Field Service) has an internal VENT port, not accessible to the user.

Fig. 14 - Control mode – state of the valves

a) Range Parameters



WARNING!

Before connecting the instrument under test to the output port it is recommended to configure the output range parameters. These parameters limit the controller output range, in order to protect the instrument under test.

To change the pressure controller output range press the **SETTINGS** button shown below and edit the **Min** and **Max** values in the **RANGE** tab. All parameters set in these menus are the same engineering unit of the execution mode (measure / control). The engineering unit used is indicated in the upper right corner of the screen. To change the unit, return to the execution mode (measure / control) and touch on the unit (Pa, psi etc) and select the desired unit.



Fig. 15 - Range parameters

Changing the output range is useful when the pressure range of the instrument under test is lower than the control module range, to protect against overpressure at the instrument.

b) Changing the set point

Press the **SP** button or touch the **Indicated Value** to change the set point to the desired value. When the pressure is stabilized, its reading value turns to **green**.



Fig. 16 - Control Mode – Changing Set point Value

The state of the output isolation valve is user configurable. To change the state of the valve, press the **SETTINGS** button shown below and change the **Output Parameters** (OPEN / CLOSED) in the **ADVANCED** tab.



Fig. 17 - Output Isolation Valve

c) Stabilization Settings

When the controlled pressure is within the limits established by the Stabilization Settings, its reading value is shown in **green (stable)**. When it is outside, it is shown in **red (not stable)**.

You can configure the **Error Window** (\pm value in the current unit of pressure) that a stable pressure reading can deviate from the set point value, and the **Minimum Time** (in seconds) the pressure reading must be inside these limits to indicate stable.

Press the **SETTINGS** button and select the **CONTROL** tab shown below, edit the values in **Stabilization Settings** and press the **APPLY** button.

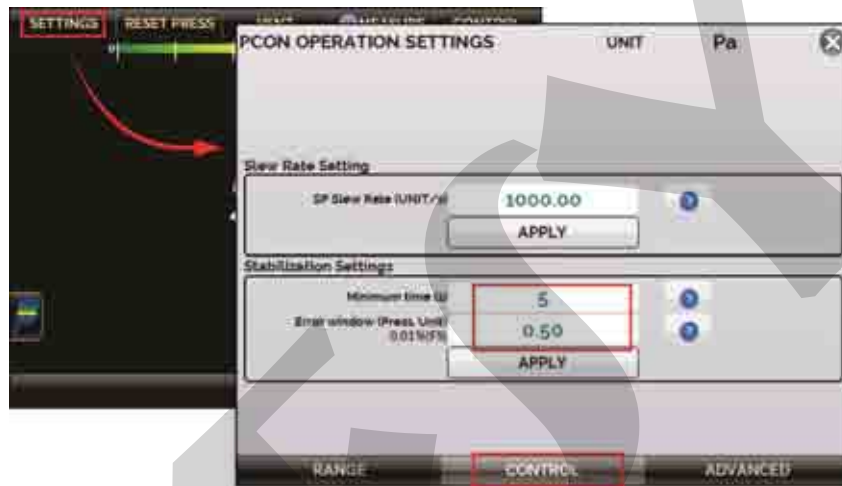


Fig. 18 - Stabilization Settings

d) Control Settings

The PCON-Y18-LP has a linear controller output behavior when the set point is changed. It means that the output varies linearly according to the parameter **SP Slew Rate** (*Pressure Unit / second*). The controlled pressure will be closer to the linear behavior for lower values of pressure rate, protecting the instrument under test from overshoot.

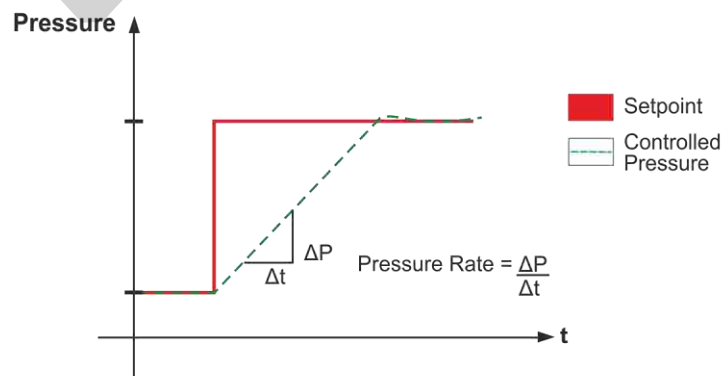


Fig. 19 - Linear Control Mode

Edit the Control Parameter by pressing the **SETTINGS** button shown below. Go to the **CONTROL** tab and edit the **SP Slew Rate** (in current pressure unit / second).

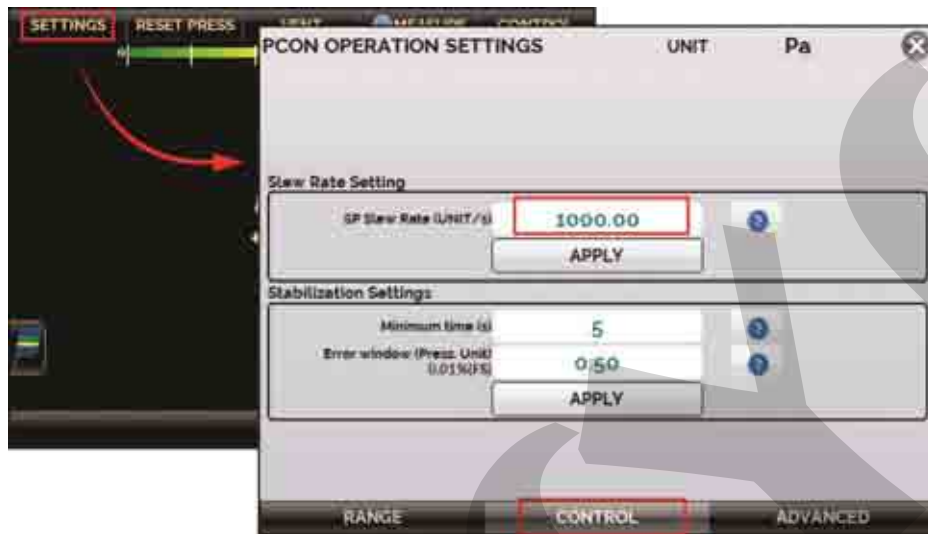


Fig. 20 - Control Parameters

Increasing the flow the output tends to be more stable, but it may cause overshoot. Reducing the flow minimizes the overshoot, but can cause instability.

It is possible to adjust the Flow of the output in order to improve stability when it is unstable.

*Note: The following menu is protected by password. To enable it enter in the main menu **SETTINGS** > **SYSTEM** > **ADJUST CAL.** and enter the password **9875**. Returning to the **CALIBRATOR** menu, the **OPTIMIZATION OPTIONS** are enabled.*

In the **SETTINGS** menu, on the **CONTROL** tab, check the **OPTIMIZATION OPTIONS**. The options are:

Flow Adjustment: Manual flow rate adjustment option. By increasing the flow, the output tends to be more stable, but can cause overshoot. Reducing flow minimizes overshoot, but can cause instability.

AUTO TUNE: Automatic flow adjustment option. Whenever this function is selected, the controller starts an algorithm to optimize the best flow rate to achieve the best control stability.

AUTOMATIC TUNE: Automatic flow adjustment option. When **ON** is selected, the flow optimization algorithm is always active.



Fig. 21 – Control Optimization Options

e) Preset Set points

Configure your most frequently used set points with the **PRESET** function. You can edit up to eight points (P1 to P8). Pressing the **OK** button the set point is automatically changed to the value of the corresponding point.

Another fast way to change the set point to the preset values is using a numeric keyboard connected to the PCON-Y18-LP Type A USB (see **section 1.5** – Parts Identification). In Control Mode, when pressing from 0 to 7 in the keyboard the corresponding preset set points P1 to P8 will be controlled.



Fig. 22 - Preset Set points

f) Step Function

The **STEP** programming makes the calibrator output vary in pre-defined steps. It is useful in calibrations where some scale points are verified; for example 0% - 25% - 50% - 75% - 100%.

To generate set points, you must set the minimum and maximum range points (**MIN** and **MAX**) and the desired number of points.

If you want each step is achieved automatically after a preset time, you must set the **TIME** (in seconds). In this case, the steps are controlled automatically and continuously.

To start the STEP function, change the status of the **EXEC** switch to **ON**. Once the function is activated, the output starts executing the **STEP** program. The steps are automatically and continuously controlled according to the set time.



Fig. 23- STEP Function (automatic step program)

If a zero value is set for the time, the steps are not changed automatically (manual step program). In this case, to move to the next step you must press the next set point value button. By pressing the previous set point button, it returns a step.

If the Wait Stabilize box is selected, the PCON-Y18-LP will wait for pressure stabilization before changing to the next set point.



Fig. 24 - STEP Function (manual step program)

g) Nudge Function

The **NUDGE** function enables the user to change the set point up or down by small steps. Press the **NUDGE** button to edit the step size. Press the “+” and “-” symbols to increment and decrement the set point.

If you are using a numeric keyboard connected to the PCON-Y18-LP Type A USB (see section 1.5 – Parts Identification), you can increment and decrement the set point by pressing the “+” and “-” buttons in the keyboard.



Fig. 25 - NUDGE Function

2.1.4. Vent Mode



WARNING!

The calibrator discharges gas to the atmosphere through the vent port. Leave this port free.



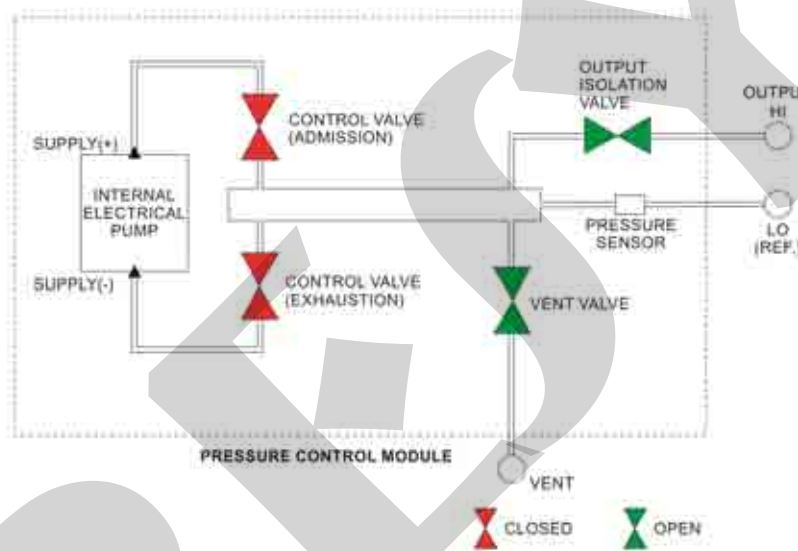
WARNING!

Before connecting the instrument under test to the output port, make a VENT operation to discharge any gas inside the controller and go to MEASURE mode.

In this mode, the calibrator turns the pressure control off and vents the pressure inside the control module through the **VENT** valve.



Fig. 26 - Vent mode – screen



Note: The FS Version (Field Service) has an internal VENT port, not accessible to the user.

Fig. 27 - Vent mode – state of the valves

The state of the output isolation valve is user configurable. To change the state of the valve, press the **SETTINGS** button shown below and change the **Output Parameters** (OPEN / CLOSED) in the **ADVANCED** tab.



Fig. 28 - Output Isolation Valve Status

To zero the current pressure measurement, press the **RESET PRESS** button. Whenever this function is used, the PCON-Y18-LP performs a **VENT** operation and an **AUTO RESET** of the pressure read in the Pressure Control module and returns to the **CONTROL** mode.



Fig. 29 - Reset of the current pressure measurement

The VENT Control Settings is accessed by pressing the **SETTINGS** button and selecting the **RANGE** tab. It presents two parameters for the VENT mode: **Vent Opening Limit** (in the current pressure unit) and **Vent Rate** (in the current pressure unit/ second).



Fig. 30 - VENT Configuration

When the **VENT** mode is started, first the calibrator reads the pressure in the control module. If the pressure measurement is below the **Vent Opening Limit** value, the control is shut off and the **VENT** valve opens. Otherwise, if the pressure is above this limit, the controller reduces the pressure down to the **Vent Opening Limit** value by varying it according to the **Vent Rate** parameter. When the pressure reaches this limit, the control is shut off and the **VENT** valve is opened.

The **VENT** valve remains opened until another Operation Mode (Control or Measure) is started. To select another operation mode, press the **VENT** button again.

2.1.5. Changing the Engineering Unit

To change the Pressure or the Temperature Unit press on the current engineering unit (Pa, kPa, °C etc.), select the desired option and press **OK**.



Fig. 31 – Pressure/Temperature Unit

2.1.6. Filter Intensity

If necessary, you can configure the **filter intensity** applied to the pressure reading. When filtering the measured pressure is not required, just set this parameter to **NO**. The filter intensity is applied only to the reading; it does not affect the pressure control.



Fig. 32 - Filter Intensity



Fig. 33 - Filter Indication

2.1.7. Auxiliary Input

At the bottom of the screen, an input can be configured. When an input is selected, the screen will split automatically, showing two simultaneous variables. To select an input, just touch the **INPUT** bar.



Fig. 34 - Auxiliary Input

Select through the menu the type of signal to be measured and use the corresponding terminals (see **Fig. 37 – Input Connections** or press the **HELP** button).



Fig. 35 - Auxiliary Input Type Selection

For **OHM** and **RTD** measurement, you should also select between 2, 3 or 4 wires options. The **SWITCH** input is a measurement of continuity of an external contact connected to the input (between RTD1 and RTD4) of PCON-Y18-LP. When there is continuity, the entry shows **CLOSED**, otherwise it shows **OPEN**.

The **PRESSURE** option activates the pressure measurement by the PCON-18-LP pressure control sensor (C1).

Whenever the input signal is above or below the input ranges established in the specifications, the display indicates **OVER** or **UNDER**, respectively.

The engineering unit can be changed by clicking on it (psi, atm, etc.) and selecting the desired option.



Fig. 36 - Selecting the Engineering Unit

The **NONE** option turns the auxiliary input function off.

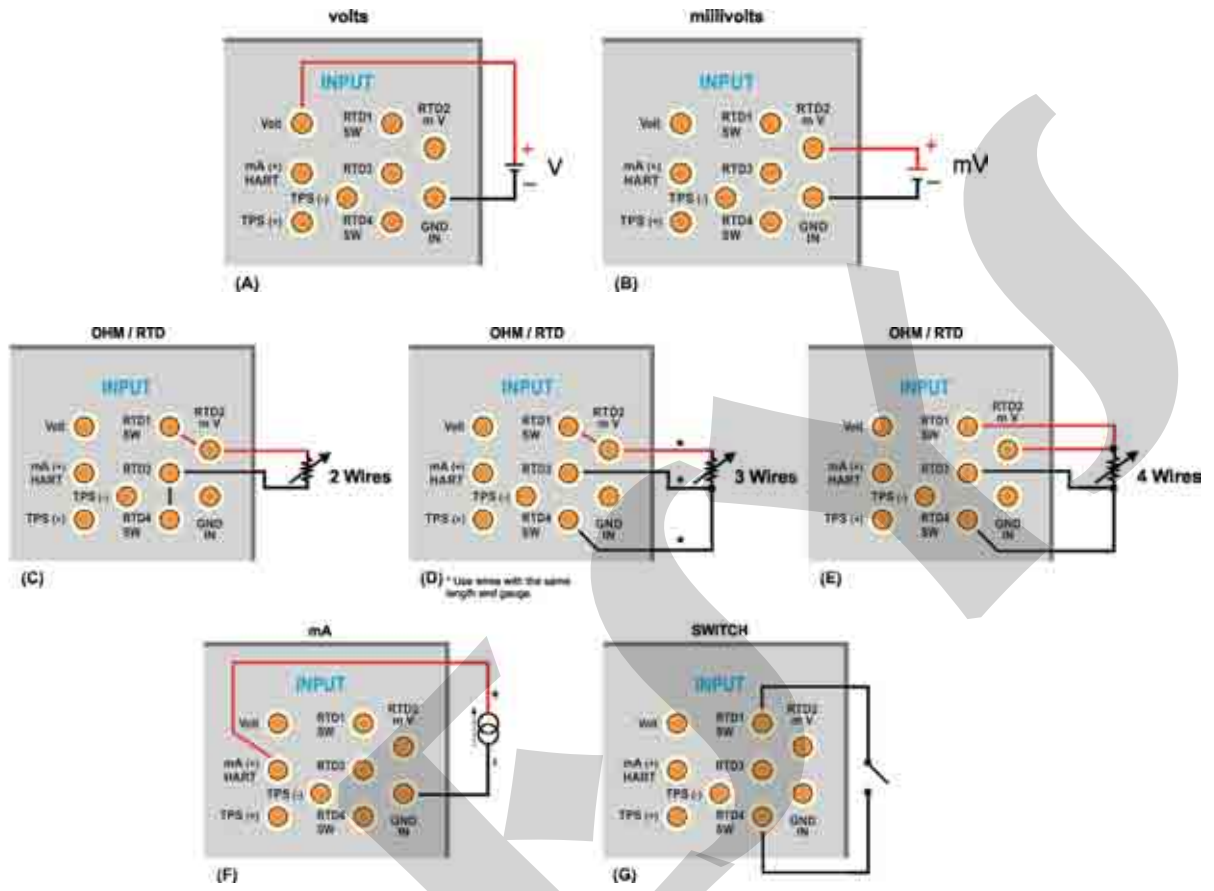


Fig. 37 - Auxiliary Input Connections

2.1.8. Transmitter Power Supply (TPS)

The PCON-Y18-LP has the TPS (transmitter power supply), 24 Vdc, galvanically isolated and provided with short-circuit protection (current limited to 30 mA).

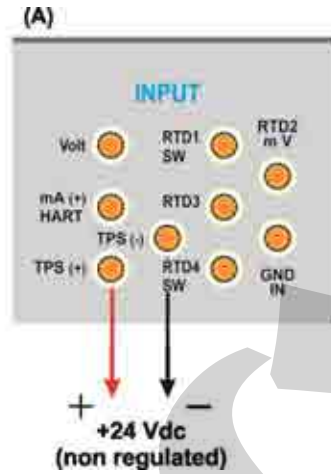


Fig. 38 - TPS Power Supply

2.1.9. Auxiliary Input Scale Function

When selecting **SPECIAL FUNCTION** in the auxiliary input channel, the display will show:



Fig. 39 - Auxiliary Input Special Function

The selected special function will act on the previously selected input. After selecting and configuring the special function, enable it by changing the key status to ON. To disable it change the key to OFF. To change the state of the key, just click on it.

When there is no active special function, the message **NO SPECIAL FUNCTION** is displayed at the top of the screen.

SCALE Function



Fig. 40 - SCALE Function (LINEAR)

It establishes a linear relationship between the PCON-Y18-LP input signal and what is shown on the display, according to the graphic below:

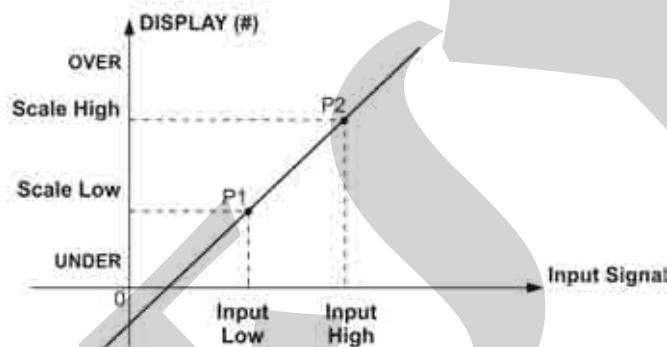


Fig. 41 - SCALE Function (LINEAR)

The scaled indication on the display (#) may represent any engineering unit, such as: m/s, m³/s, %, etc. The number of decimals, up to four, shown on the display may be configured.

The value for **Input High** must be necessarily higher than **Input Low**. On the other hand, **Scale High** and **Scale Low** may have any relationship between themselves: higher than, lower than or equal to, and they may have a signal before them. Thus direct or reverse relationships may be established.

For the current input, a linear relationship may be established as it has been previously shown or it may be squared (**FLOW**) as illustrated below:

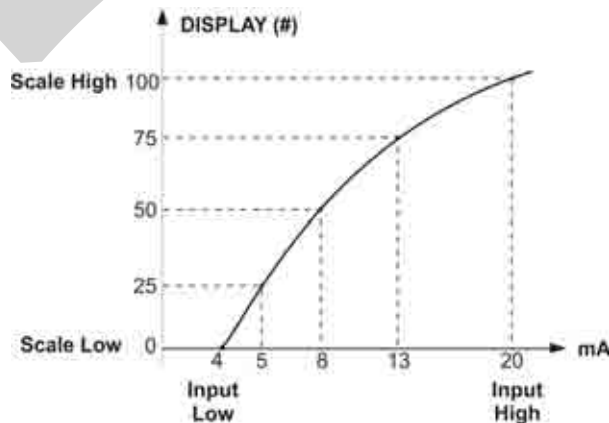


Fig. 42 - SCALE Function (FLOW)

2.1.10. Calibration Examples

a) Pressure Transmitter Calibration

Use the PCON-Y18-LP **TPS** source (24 Vdc) to power up a two-wire transmitter and connect the current as illustrated below. Select **mA** (current) in the **Input (Auxiliary)** menu and configure the Pressure Control parameters.

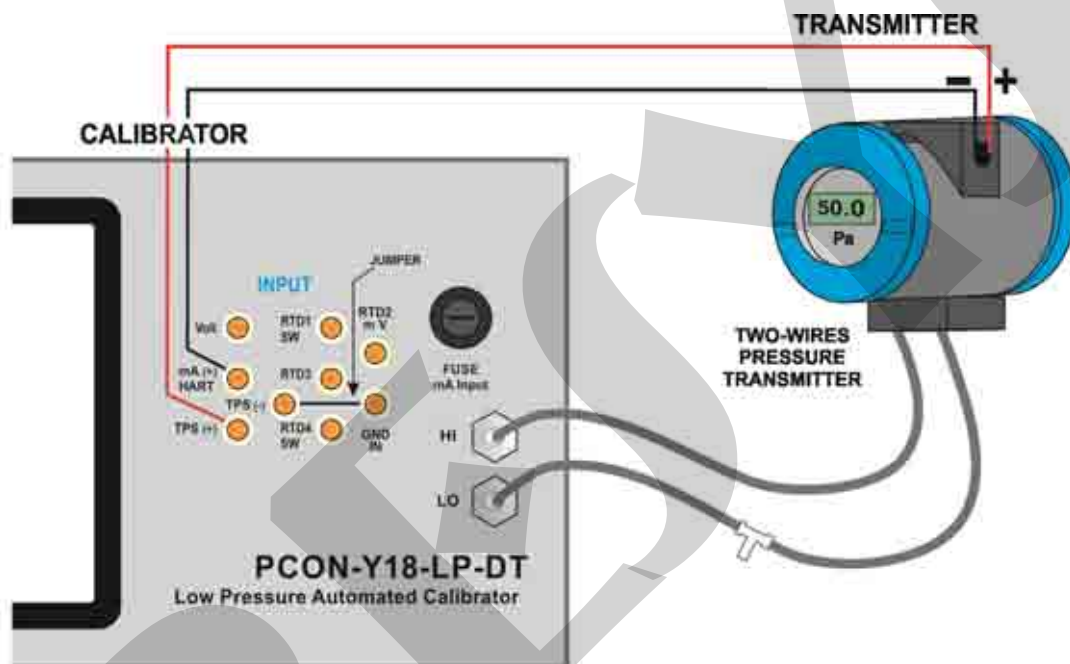


Fig. 43 - Pressure Transmitter Calibration

Readings of the mA input can be scaled to pressure through the **SCALE** option (see section 2.1.9.). Thus, the error between the input and the output of the pressure transmitter is easily calculated.

b) Pressure Switch Verification

Pressure switches are devices that receive a pressure signal and have relay alarm. The relay is activated whenever the pressure passes above or below a certain setpoint alarm.

Connect the pressure switch relay output to the switch input of PCON-Y18-LP, **RTD1** and **RTD4** terminals, and make the pneumatic connections as illustrated in the figure below.

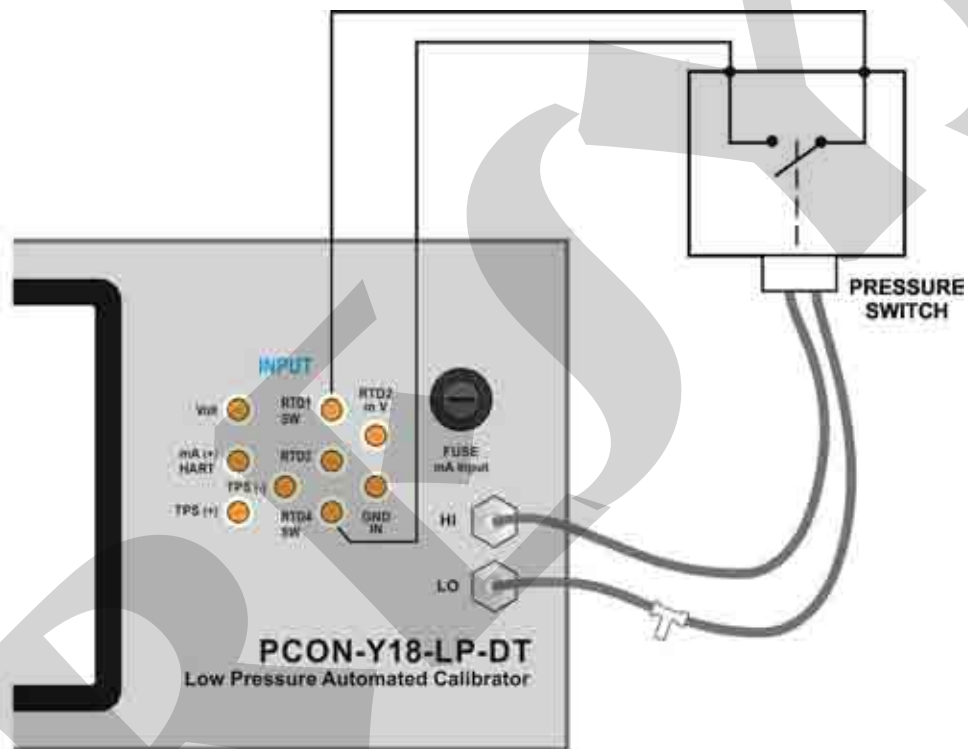


Fig. 44 - Pressure Switch Verification

Select **SWITCH** in the **Input (Auxiliary)** menu and configure the Pressure Control parameters (the **Control** Operation Mode must be selected).

To perform the automatic pressure test, press the PRESSURE SWITCH as shown in the following figure.



Fig. 45 - Pressure Switch Test

Select the **PRESS SWITCH TEST** button, fill in the **MIN** and **MAX** fields (the minimum and maximum pressures at which the test will be done) and select one of the options: **Fast**, **Medium** and **Slow** (the **slow** mode takes a longer time because it realizes more test cycles). If you know the approximate pressure the relay changes position, reduce the test range (MIN and MAX values) for a faster and more accurate test.

Press **START** to start the pressure switch test. PCON-Y18-LP will control the pressure at the output port from the **MIN** to the **MAX** pressure value. The instant the relay changes from closed to opened it is shown on the display the alarm set point pressure switch. Then PCON-Y18-LP starts to decrease the output pressure to find a transition switch from opened to closed, in order to calculate the hysteresis.



Fig. 46 - Pressure Switch Test Result

2.1.11. Leakage / Stability Test

The leakage / stability test measures the variation of a signal for a certain time. It is useful, for example, to check for pressure leak in the system.

To do the test, put the PCON-Y18-LP in **Measure** mode (the pressure control valves are off) and select the **Input** desired (the leakage / stability test may be done with any of the Auxiliary Input signals, for testing the pressure in the control module select **PRESSURE** → **C1**).




Fig. 47 - Leak test, select MEASURE mode and the Auxiliary Input

Press the **Quick Navigator** icon  → **MENU** → **BAR GRAPH**.



Fig. 48 - Menu (Quick Navigator)

Press the  icon to go to the **Leak/Stability Test**.

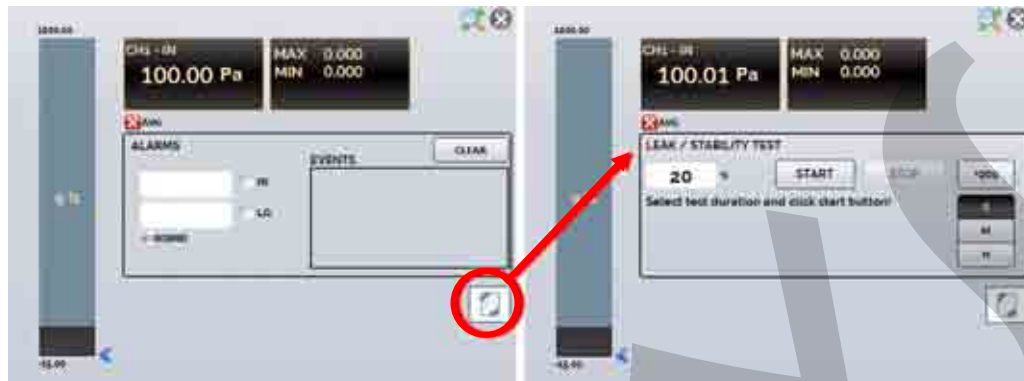


Fig. 49 - Leak/Stability Test - screen

Define the test duration (in seconds) and press the **START** button.



Fig. 50 - Leak/Stability Test - results

During the test, you can increase the test time by pressing the **+20s** button. The **S**, **M** and **H** buttons change the time unit to second, minute and hour, respectively. It is shown on the display the variation of the signal from the first to the last reading (ΔV) and the increasing or decreasing rate is calculated (**Average**, in input unit / time unit).

2.2. HART®

PCON-Y18-LP can be used to read and set parameters in devices that have HART® Communication Protocol. The HART® Protocol allows digital communication between master (in this case, PCON-Y18-LP) and the slave (field instrument) superimposed on the 4-20 mA analog signal. To access this function from the main menu, select the **HART®** option.

The HART® Communication of PCON-Y18-LP is an optional module. The calibrator has three versions: **NH** (without HART® Communication), **CH** (HART® Calibrator) and **FH** (Full-HART® configurator with DD library).

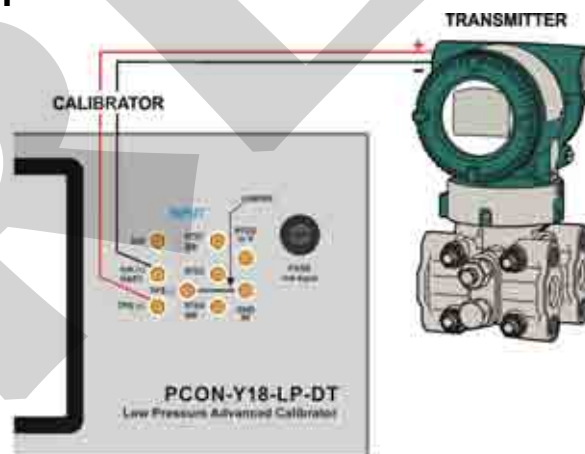
The **CH** option has basic and universal commands for HART® communication (zero, span, trim mA etc.) that allow you to adjust the range of the instrument, monitoring the primary variable, current adjustment etc. The **FH** option, in addition to basic and universal commands, is provided with the DD library (Device Description) from *FieldComm Group* and allows the setting of specific parameters of each instrument.

The following description is valid for **CH** and **FH** options.

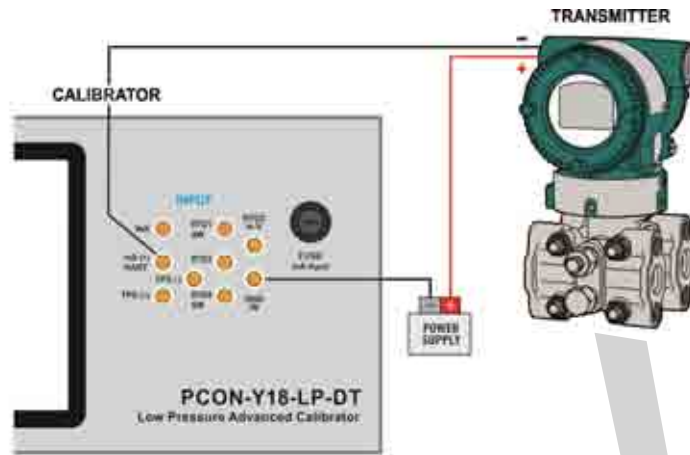
2.2.1. HART® Connections

When selecting HART® from the main menu the **mA INPUT + HART** and **ONLY HART (INCLUDING NETWORK)** options are shown. An internal resistor (250 Ω) can also be enabled or disabled. The option must be chosen according to the type of connection to be made.

mA INPUT + HART®



**Fig. 51 - Transmitter Powered up by the Calibrator Itself (TPS)
mA INPUT + HART® (Internal Resistor Enabled)**



**Fig. 52 - Transmitter Powered up by an External Power Supply
mA INPUT + HART® (Internal Resistor Enabled)**

For the connections shown in **Figures 51 and 52**, use the **mA INPUT + HART®** option and **INTERNAL RESISTOR** enabled. In this mode, the 250 Ω resistor is activated internally in series with the calibrator mA input. The calibrator can measure current from the transmitter and also read and set parameters via HART®. If the internal resistor is not enabled, an external resistor of at least 150 Ω must be inserted in series with the mA input. To power up the transmitter, the PCON-Y18-LP TPS source (**Fig. 51**) or an external source (**Fig. 52**) can be used.

ONLY HART (INCLUDING NETWORK)

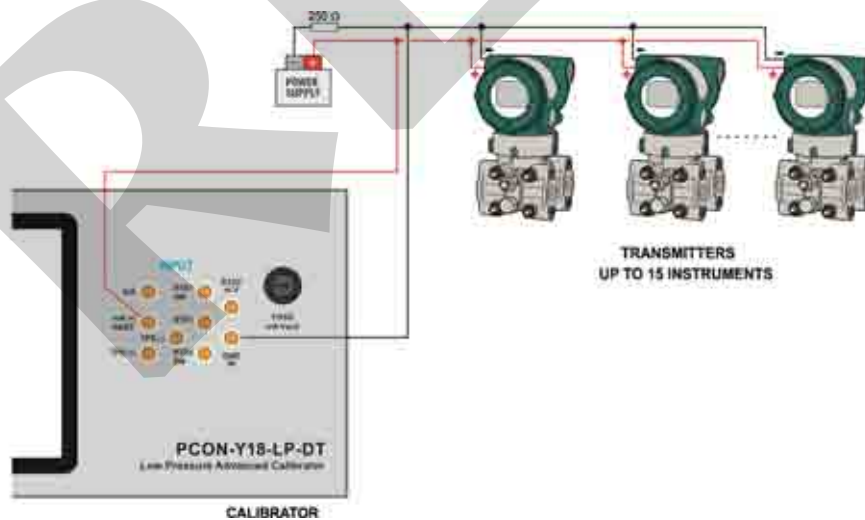


Fig. 53 - ONLY HART®

IMPORTANT: Before connecting the calibrator to the transmitter(s) as shown above, make sure that the mA input is not selected in the PCON-Y18-LP (Enter the Calibrator menu and select any other auxiliary input than mA or select the option NONE)

For the connection shown in **Figure 53**, use the option **ONLY HART®**. In this mode, the internal resistor and the mA input are disabled. The HART® resistor (at least 250 Ω) must be externally inserted in series with the power source and the transmitter. In this case, the calibrator does not perform the measurement of the transmitter current, but can read and configure its parameters via HART®.

2.2.2. Starting Communication

Entering the **HART®** menu, the following screen is shown. Enabling the **HART® CONFIGURATOR** option (only for **FH** version) you have access to Full-Hart software (DD library) with all device parameters. Disabling this function, the **CH** software is launched with basic and universal commands for Hart® communication (zero, span, trim mA etc.).

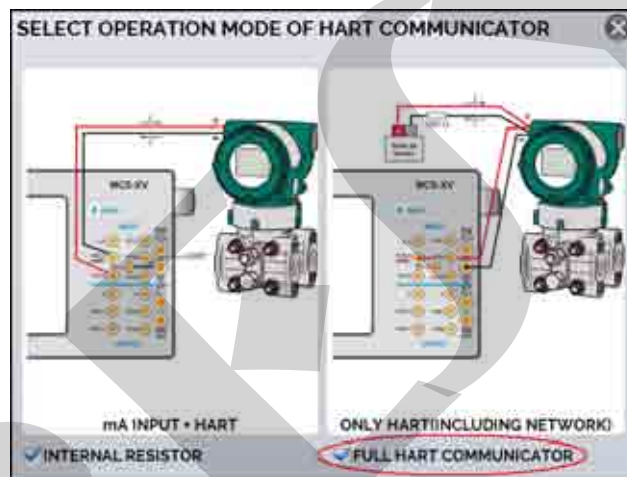


Fig. 54 – ONLY HART®

Then, define the internal resistor (250 Ω) and the configuration of HART® connection type (**mA + HART®** or **ONLY HART®**).

For the **CH** option must be inserted the instrument **ADDRESS** with which to communicate and press the **CONNECT** button. If the address of the instrument is not known, the **SEARCH** button can be pressed, which will search for instruments in the address range from 0 to 15.

Up to 15 instruments in a HART® network (addresses 1 to 15) are allowed. For a single field instrument with address 0, on the **mA IN + HART®** connection, the primary variable can be read both analog (4 to 20 mA) and digital (HART®). In network connection, the only way to read the primary variable is digitally (**ONLY HART®**).

2.2.3. Adjusting the Measurement Range of a HART® Transmitter (CH Option)

While the instrument is being connected, in the **DEVICE INFO** tab are shown information about instrument identification, such as TAG, manufacturer, description, message, date, measuring range and damping filter. Some of these parameters can be changed in **DEFAULT SETTINGS**.

In the **DEVICE INFO** tab, the **MIN** and **MAX** fields indicate the measuring range of the HART® transmitter. For PV (primary variable) equal to the MIN value, the transmitter should generate 4 mA. For PV (primary variable) equal to the MAX value, the transmitter should generate 20 mA. The maximum allowable range of the transmitter is shown just above (**RANGE ...**). To edit the range of the transmitter, just change the MIN and MAX values and press the **SAVE RANGE** button.

On this screen you can also edit the unit of the primary variable and the input filter (damping).

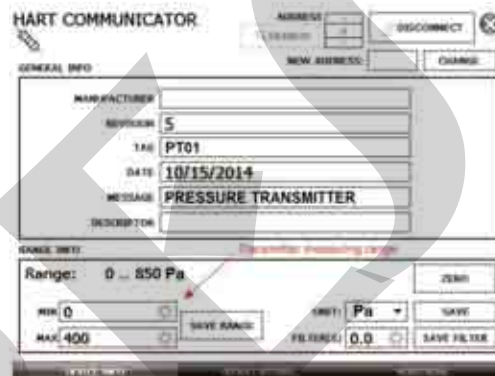


Fig. 55 - Adjusting the measuring range of the HART® transmitter

2.2.4. Adjusting the Measurement Range of a HART® Transmitter with Reference (CH Option)

Another way to adjust the range of the transmitter is to generate the minimum and maximum values of the desired range in the transmitter input and to adjust these values as minimum and maximum (set by reference).

To adjust the range of a pressure transmitter, connect the transmitter pressure input to the output port of the Pressure Control Module. Go to the **Calibrator** option, configure the control parameters and select the **Control** mode. Select **mA** at the **(Auxiliary) Input** and press the **Hart** button. The pressure control will work as the standard value for the adjustment range of the instrument.



Fig. 56 - Quick HART® adjustment with reference

Generate pressure to the transmitter input corresponding to the lower range value and press the **-** button. Transmitter will generate 4 mA to this value. Generate pressure to the transmitter input corresponding to the upper range value and press the **+** button. The transmitter will generate 20 mA for this value.

Another way to do this adjust is to enter in the **HART** option through the **MAIN MENU**, set the connection type, address and then press **CONNECT**. Select the **MONITOR** tab. In this screen it is shown the value of the primary variable (PV) read by HART® (digital), the current that the transmitter wants to generate (**AO - DIGITAL OUTPUT**), and the current measured by PCON-Y18-LP (**ANALOGIC READ**). Set the pressure controlled pressing **OUTPUT** and adjust the transmitter range by pressing the **↓ Inf Range** and **↑ Sup. Range** buttons.



Fig. 57 - Adjusting the Measuring Range of the HART® Transmitter with Reference

2.2.5. Checking / Adjusting HART® Transmitter mA Output (CH Option)

In **DEFAULT SETTINGS** tab the output current of the HART® transmitter (output trim) can be adjusted according to current measured by the calibrator. You can make this adjustment only when the PCON-Y18-LP is connected to a single transmitter with address 0, in the **mA INPUT + HART®** option of connection, since the calibrator needs to measure the current to make the adjustment.

Before performing the adjustment, a transmitter output current check can be performed by pressing the **CHECK** button. The transmitter will generate a fixed current (4, 8, 12, 16, 20 mA) and the calibrator will show the measured values for each point.

To adjust automatically, simply press the **AUTO** button. The calibrator will send the commands to the transmitter to generate 4 and 20 mA (fixed), make the measurement of these points, and adjust the output (trim). The adjustment is completed when the **D/A Adjustment Completed** message appears.

The **LEAD TIME** field sets the time (in seconds) of each point stabilization time.

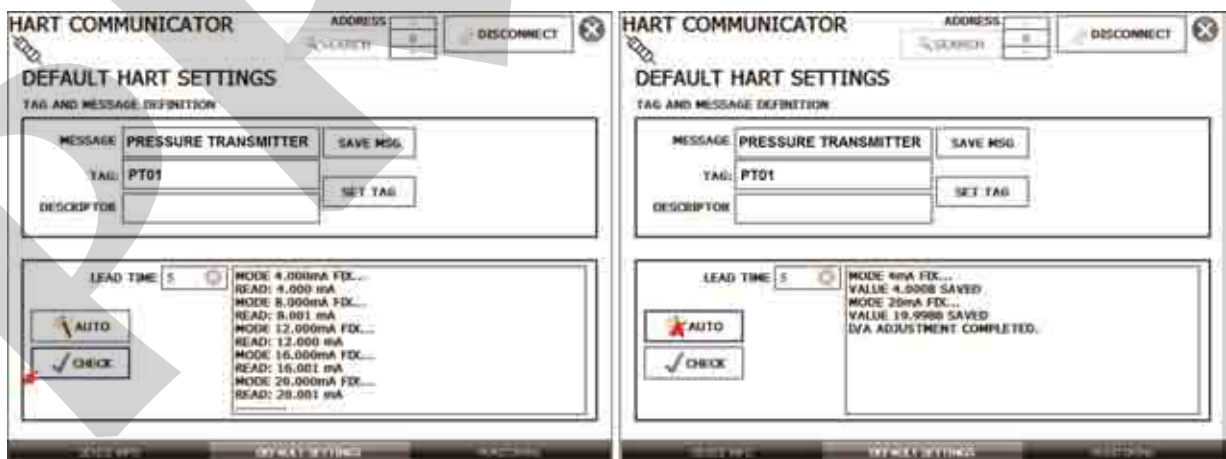


Fig. 58 - Checking / Adjusting the mA HART® Transmitter Output

2.2.6. Full-Hart Configurator (FH Option)

If the **HART® CONFIGURATOR** option is enabled, the **FH** software starts. For this option, the instrument is automatically found and the calibrator will display the basic, universal and specific parameters (DD library).

To start the HART configurator you must wait for the PCON-Y18-LP read all the instrument parameters. The PCON-Y18-LP will display the message: **Reading device information. Please wait ...** After connected, at the bottom of the screen will show the TAG, model of the connected instrument and the DD (Device Description) file used.

You can open the instrument configuration tree, located on the left side of the screen. This tree changes according to the instrument, since each HART® transmitter has its specific commands.

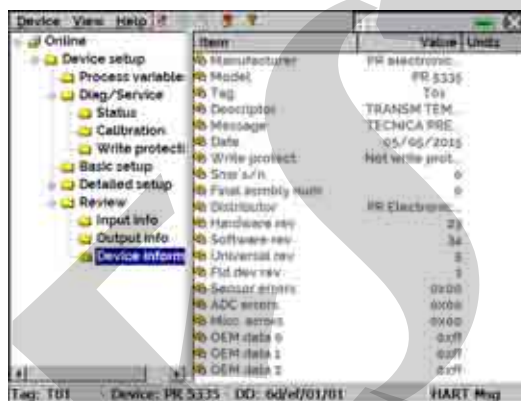





Fig. 59 – Device Parameters

Double-click the parameter you want to change and edit the value.

Parameters identified by the icon  have methods. To change them, double click on the parameter and follow the indicated steps.

For other parameters, after editing, the value of the field turns yellow, indicating that there has been a change but it has not yet been saved in the transmitter. To confirm, press the button . To cancel press .

To view the value of mA input or change the output set point, press the button

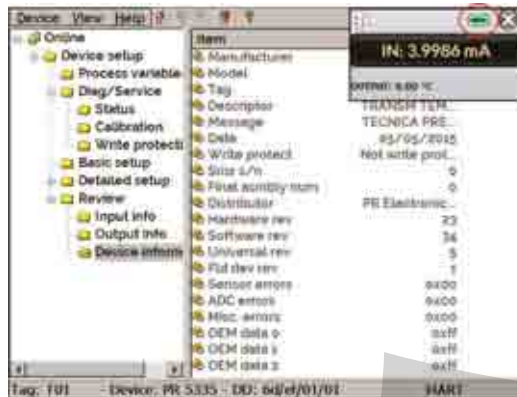


Fig. 60 - Calibrator / Controller Input and Output Values

To view the status of the device, enter the **VIEW** menu and then **DEVICE CONDITION**:

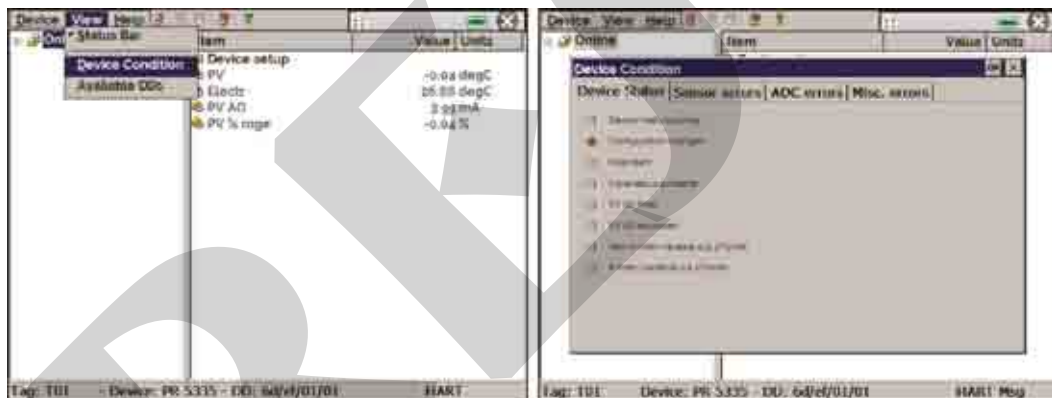


Fig. 61 – Device Status

To save the entire configuration of a HART® instrument connected to the calibrator, the **Document Device** function of the **DEVICE** menu can be used. This function is useful when you want to save the configuration of an instrument to later download to another instrument of the same model, or to back up the settings.

Press **DEVICE> DOCUMENT DEVICE**, fill in the File Name field with a name for the configuration and press **Save Device Config**. Optionally, you can note a description of the configuration in the **Notes** field.



Fig. 62 - Saving the Configuration of a Device

When you want to load the saved configuration into an instrument, go to the **DEVICE> DOWNLOAD / VIEW** menu. To select the configuration file, double click on it.

Press the **WRITE** button to download the configuration file for the connected instrument. Before the instrument is fully configured, some confirmation messages will be displayed. To cancel, press **X**. To continue, press **OK**. At the end of the configuration, the **Configuration Write Complete** message appears.

2.3. Automatic Tasks

In PCON-Y18-LP, automatic calibration tasks can be created and performed. This option can be used to generate calibration work orders for transmitters and indicators. PCON-Y18-LP also creates and performs tasks for calibration of analog gauges, using the inverted calibration method, so the user can change the control set points in small steps until the expected value is being indicated on the gauge.

2.3.1. Creating Tasks

To create tasks from the main menu, select **CALIBRATOR**. Select the desired type of **Input (Auxiliary)** and the **Pressure Control Module** configuration (select the **Control** mode). For example, to calibrate a pressure transmitter, select the Control mode and mA auxiliary input (which will be connected to the current output of the transmitter). For a pressure indicator, e.g., selected **NONE** for the auxiliary input.

To calibrate an analog gauge using the inverted calibration method, select **NONE** for the input.

Press the  icon, and select **TASKS** and **CREATE NEW TASK**.

Fill in at least the serial number of the instrument to be calibrated, instrument TAG, stabilization time for each point (wait time in minutes), maximum error allowed for the instrument to be calibrated (in % of the span, reading or full scale), calibration range.



Fig. 63 - Task Information

Go to the **As Found/ As Left** tab. Add each point to be generated by the PCON-Y18-LP and the expected value for the instrument under calibration, for both **As found** (calibration done before adjustment) and **As left** (calibration done after adjustment). Points can also be generated with the help of the **AUTO** button. By pressing this button, simply enter the maximum and minimum values of the calibration range and the amount of points so that it will be generated a list of points considering the same steps and a linear scale. Also, fill in the number of repetitions (**REP**) of readings, and the calibration strategy (initial to the final point ↑, final to the initial point ↓, etc.). If the As-Found repetitions are set to 0 (zero), the task will contain only As-Left calibration.

For inverted calibrations, select the option **INVERTED CAL** (this option is available only if the input type **NONE** has been selected).

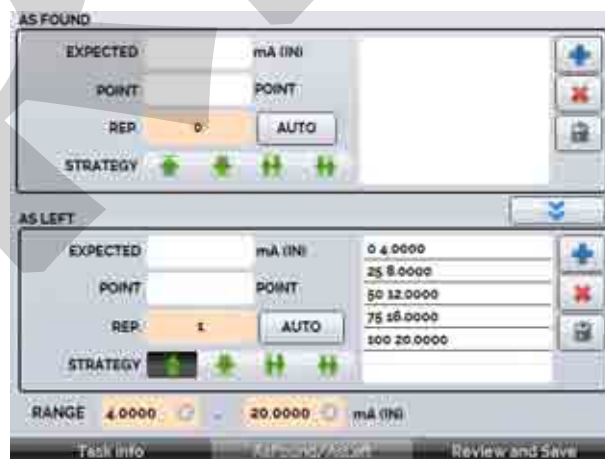


Fig 64 - Task Points and Strategy

Go to the **Review and Save** bar. Choose an identification name/number for your task. If you want to save the model of this task for later use in creating other tasks, press **SAVE TEMPLATE** and give a title for it. When you want to open this model again, open the task creation screen and press **OPEN TEMPLATE** in **Task info** tab.

Click on the **CREATE** button to create the task. It is now saved in the calibrator.



Fig. 65 - Creating a Calibration Task

2.3.2. Performing Tasks

To perform an existing task, select **TASKS > EXPLORE TASKS** from the main menu. A list identifying the created work orders that have not been performed yet (**• WAITING**) is shown. Select the desired task and press **OK**. Make the necessary connections between the calibrator and the instrument to be calibrated and press **START**.

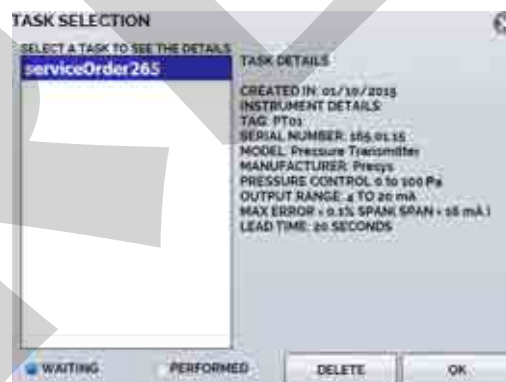


Fig. 66 - Exploring tasks

PCON-Y18-LP automatically starts the calibration by generating the set points registered in the task and doing the reading of the instrument to be calibrated. If you select the **NONE** option for the input, for each generated point the calibrator requires the value read by the instrument.

For inverted calibrations, it is possible to vary the control set point in small steps, until the pointer of the analog gauge indicates the desired value. When the initial set point stabilizes, the following screen is shown. This set point variation is made through the buttons “+” and “-” and the steps shall be established by the option **STEP**.

When the analog gauge reaches the desired value, press **OK** to confirm the point.



Fig. 67 - Inverted Calibration

The result will be displayed on the screen, and a progress bar is displayed to indicate the calibration remaining time. At the end of the calibration, a report is shown with the generated values, the obtained values, the expected values, and the error. If the error is higher than the registered value for the task, the line appears in **red**.

The first time that a task is performed, it will be saved as **As-found** (before adjustment). If it runs again, it will be saved as **As-left** (after adjustment). The results are saved in the calibrator and can be viewed at any time.

2.3.3. Viewing Results

Once a task has been performed, it remains saved in the calibrator.

To view the results of a calibration by the PCON-Y18-LP, select **TASKS** in the main menu.


Enable the **PERFORMED** option. The list will show only the tasks that have been performed. Select the desired work order and press **OK**. On the screen, the report with the calibration points, the obtained values, expected values and the errors will be shown. If the error is higher than the value registered for the task, the line appears in **red**.

POINT	EXPECTED	OBTAINED	ABS. ERR.	SPAN ERR.
0.00 #	4.0000 mA	4.0007 mA	0.0007 mA	0.004%
25.00 #	8.0000 mA	8.0022 mA	0.0022 mA	0.014%
50.00 #	12.0000 mA	12.0014 mA	0.0014 mA	0.009%
75.00 #	16.0000 mA	15.9989 mA	-0.0011 mA	-0.007%
100.00 #	20.0000 mA	19.9985 mA	-0.0015 mA	-0.008%

Fig. 68 - Viewing the Task Result in the Calibrator

The PCON-Y18-LP saves the task data in a PDF file in the internal memory card. To access the files saved on the PCON-Y18-LP internal memory, connect the USB cable to the computer (type A USB) and to the PCON-Y18-LP (Micro-B USB) (see section 1.5 – Parts Identification).

To save the data in a Pen Drive or External HD, press the Pen Drive icon  after saving the data.

To print the Calibration Report, press the printer icon . The printer must have been previously configured in **SETTINGS > SYSTEM > PRINTER CONFIG** and must be connected to the Type A USB Host port of PCON-Y18-LP (see section 1.5 - Parts Identification).

Calibration report for tag PT01

TASK SETTINGS
 CREATED IN: 01/10/2018
 INSTRUMENT DETAILS:
 TAG: PT01
 SERIAL NUMBER: 195.01.18
 MODEL: Pressure Transmitter
 MANUFACTURER: Presys
 PRESSURE CONTROL: 0 to 100%
 OUTPUT RANGE: 4 TO 20 mA
 MAX ERROR: ± 0.1%, SPAN: SPAN ± 0.1 mA
 LEAD TIME: 30 SECONDS

As left performed by:

POINT	EXPECTED	OBTAINED	ERROR	SPAN ERR.	PASS/FAIL
0.00 #	4.0000 mA	4.0007 mA	0.0007 mA	0.004%	Pass
25.00 #	8.0000 mA	8.0022 mA	0.0022 mA	0.014%	Pass
50.00 #	12.0000 mA	12.0014 mA	0.0014 mA	0.009%	Pass
75.00 #	16.0000 mA	15.9989 mA	-0.0011 mA	-0.007%	Pass
100.00 #	20.0000 mA	19.9985 mA	-0.0015 mA	-0.008%	Pass

Standard serial number: 195.12.16
 Standard last calibration: 10/09/2016
 Operator signature: _____

Fig. 69 - Printed Task Report

To access the files saved on the SD card (internal files / memory) of the calibrator, connect the USB cable to the USB Type A port of the computer (USB type A) and the USB Device port of the PCON-Y18-LP (USB type B for version RM, and USB micro type for the DT version, see section 1.5 – Parts Identification).


The logo can be changed to one of your own company. To do this, connect a USB cable between the USB Device port of the PCON-Y18-LP and the USB Type A port on the computer. Change the LOGO.bmp file to your logo file (it should have a .bmp extension). We recommend an image of size close to 200 x 200 pixels.

To add your signature to the Report, create a signed user in the **Settings** → **System** menu (see section 2.6.1 of this manual, "System") and enable password protected access.

2.4. Data Logger

PCON-Y18-LP allows you to record a series of measurements over time to display data in a chart or table format.

Select **CALIBRATOR** from the main menu and select the desired configuration for Pressure Control and Auxiliary Input.

Press the icon  and select **DATA LOGGER**.

The calibrator automatically starts the measurements and displays each measured point on the chart.

For measurements to be saved, you must press the **REC** button (see **Figure 70**). With this option selected, all points (measurement and time) are saved in an internal file in PCON-Y18-LP, which can be used to generate a table or chart.

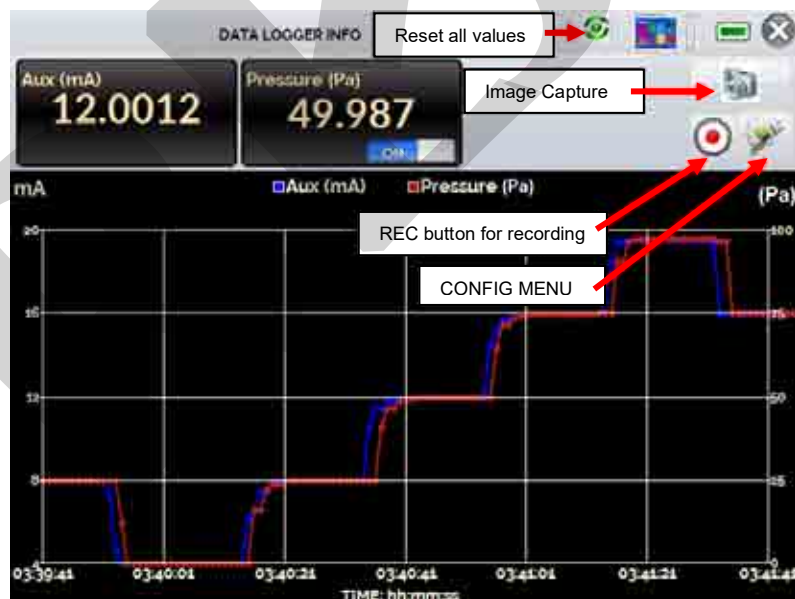


Fig. 70 - Data Logger


In the configuration menu (icon ) , you can edit the background color of the chart, color and line thickness, sampling rate (in seconds) and set the x (time) and y (measurements) axis of the chart.



Fig. 71 - Data-Logger Configuration Menu

Recording can also be programmed to start at a certain date and time in the **LOGGER** option. Just set the start time and end time of recording. During the defined range, the measured points are saved in an internal file in PCON-Y18-LP.

To view a saved file press the **OPEN** button, select the desired file, and press **LOAD**. The file name contains the date and time of the measurements.

The **SHEET** button allows the visualization of data in table format, with the date and time of the measurement and the measured values.



If the user wants to export the current data to a “.csv” file that can be opened in spreadsheet software, press the **SAVE** button and indicate the name and where it will be saved.

The button  saves the current screen image as a “.png” file. All saved screens can be viewed in the **IMAGE** menu.

If a Pen Drive is connected to the USB port, the data logger files (images and data) may be saved in it. If a Pen Drive is not connected, these files are saved in the internal SD card of the calibrator. To access the files saved on the PCON-Y18-LP internal memory, connect the USB cable to the computer (type A USB) and to the PCON-Y18-LP (Micro-B USB, see section 1.5 – Parts Identification)

2.5. Videos

PCON-Y18-LP has a video player. These videos can be viewed while a calibration is performed and are designed to assist in the use of the calibrator.

From the main menu, when selecting **VIDEOS** a list of video categories appears. Select the category and the desired video. Press the FULL SCREEN button  to view the video in full screen and the WINDOW button  to reduced screen.

To add new videos in the calibrator, connect the USB cable to the computer (type A USB) and to the PCON-Y18-LP (Micro-B USB, see section 1.5 – Parts Identification). Open **VIDEOS** folder. Copy the new video to any sub-folder (category) of the VIDEOS folder. If you prefer to create a new category, simply create a new folder inside VIDEOS with the title of the desired category and copy the video to this folder.

2.6. Settings

2.6.1. System

In the **SYSTEM** tab you can set the volume of the calibrator, the touch screen calibration, identification of the calibrator, language, printer and security options.

- **Touch screen Options**

To adjust the touch screen, press the TOUCHSCREEN OPTIONS button. Press the places on the screen indicated by + (it is recommended to use the stylus for touch screen). After the calibration, press again on the screen at any point. Confirm the calibration to return to SYSTEM Menu.

- **Language Setting**

Press the desired language for the system and confirm with the OK button. The system must be restarted to save the configuration.

- **Calibrator Identification**

In this option it is possible to identify your calibrator, choosing a TAG name, Owner name and Location.

- **Sound Options**

Press + or - to configure a value for the system audio volume.

- **Printer Config**



Select the Configuration for the Printer and connect it to the USB port.

- **Brightness**

Choose between the options 25, 50, 75 and 100 % for the brightness of the screen.


- **Security Options**

The instrument initially has no access password. This setting can be changed in **SECURITY OPTIONS**.

To create a new user, press the key icon  and then users icon . Fill in the blanks and press **CREATE**. It is possible to add a signature to be used when issuing a calibration report through the **TASK** feature.

Pay attention to the functions that each user level has access in the table below:

User Level	Function				
	Calibrator	Tasks	Hart®	Data-Logger	Settings
Operator	✓	✓	✗	✗	✗
Tec	✓	✓	✓	✓	✗
Admin	✓	✓	✓	✓	✓

To lock the system, press the padlock icon  in the system menu. The next time PCON-Y18-LP is turned on, it will request login and password. To unlock the system, login as an Admin Level user and press the padlock icon in the system menu again.

- **Adjust Cal.**

Adjustment level protected by password (**9875**).

2.6.2. Network and Services

In **NETWORK** tab it is configured the IP address of the calibrator for Ethernet communication with the computer. The IP address can be dynamically configured (**DHCP**) or may have a fixed address (disable **DHCP** option and edit the desired address). On this tab you can also configure the Wi-Fi Network if a USB / Wi-Fi adapter is connected.

By connecting the calibrator to the network it is possible to view and print calibration reports and saved data-logger files.

In the **SERVICES** tab you can configure remote access to the calibrator via VNC or WebServer.

2.7. Built-in Web Server

Before accessing the PCON-Y18-LP built-in web server, you must configure the network settings (see section **2.6.2.**). Connect the network cable into the Ethernet port of PCON-Y18-LP (see section **1.5** – Parts Identification).

To access the PCON-Y18-LP built-in webserver open the web browser on your computer and enter the following address.

<calibrator_IP_address>:5000/pconserver/pages/main.cgi

User: *admin*

Password: *xvmaster*

To verify the PCON-Y18-LP IP address press the button indicated below.



Fig. 72 - IP address

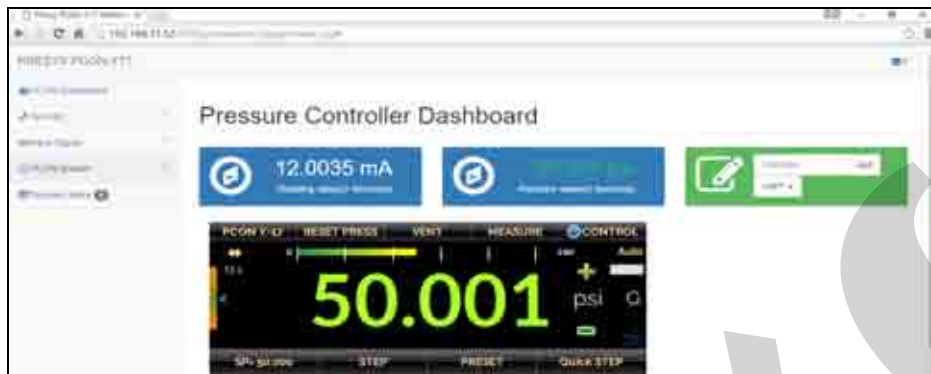


Fig. 73 - PCON-Y18-LP Web Server

In the PCON-Y18-LP Web Server, you can monitor the calibrator screen, change the set point and see the pressure and the auxiliary input readings.

2.8. SCPI Commands Set

To control the calibrator using the SCPI commands connect a serial cable to the PCON-Y18-LP USB Type A port (see section 1.5 – Parts Identification). Connect the cable to the serial port of the computer. At the menu **Settings** → **Network** → **Serial Comm**, enable the **SERIAL COMM** (RUN switch to **ON**).

Communication Parameters:

Parity: none

Data bits: 8

Baud rate: configurable at the menu **Settings** → **Network** → **Serial Comm**

Stop Bits: configurable at the menu **Settings** → **Network** → **Serial Comm**

*IDN?

Description: Instrument Identification.

Parameters: ---

Response: Manufacturer, ID, Serial Number, Software Version

*CLS

Description: Clears the errors list.

Parameters: ---

Response: ---

SOURce:PRESSure <press>

Description: Changes the Pressure Control Setpoint.

Parameters: New Setpoint

Response: ---

MEASure:PRESSure?

Description: Pressure Reading.

Parameters: ---

Response: Pressure Reading|Unit|Stability

UNIT[:PRESSure]?

Description: Current Pressure Unit.

Parameters: ---

Response: Current Pressure Unit

UNIT[:PRESSure] <unit>

Description: Sets the Pressure Unit.

Parameters: New Pressure Unit

Response: ---

SYSTEM:ERRor[:NEXT]?

Description: Checks the Errors List.

Parameters: ---

Response: Last Error

SOURCE:PRESSure:SLEW?

Description: Reads the Current Pressure Output Slew Rate.

Parameters: ---

Response: Slew Rate (in pressure unit / second)

SOURCE:PRESSure:SLEW <slewrates>

Description: Sets the Current Pressure Output Slew Rate.

Parameters: New Slew Rate (in pressure unit / second)

Response: ---

MEASure[:SCALAR]:CURRENT[:DC]?

Description: mA Input (Auxiliary) Reading.

Parameters: ---

Response: mA Reading

MEASure[:SCALar]:VOLTage[:DC]?

Description: Voltage Input (Auxiliary) Reading.

Parameters: ---

Response: V Reading

OUTPUT:MODE <mode>

Description: Sets the Pressure Operation Mode.

Parameters: VENT | CONTrol | MEASure

Response: ---

3 - Maintenance

3.1. Replacing the Current Input Fuse

To replace the PCON-Y18-LP mA Input (Auxiliary) fuse, proceed as follows:

- Rotate the fuse holder counterclockwise (see section 1.5 – Parts Identification – mA input Fuse). Try to use a plastic tool to avoid damaging the fuse holder;
- The fuse holder will be released;
- Pull the fuse holder and remove the fuse;
- Place the spare fuse (Time-Lag Type Fuse 32 mA / 250 V / 5 x 20mm).

3.2. Replacing the Power Supply Fuse

In case of blow, the power supply fuse can be replaced. The fuse may blow due to a voltage spike in the mains or a calibrator component fault. Replace the fuse once. If a second fuse blows again, it is because the fault is not that simple. In this case, contact the Presys technical support (see section 1.5 – Parts Identification – Power Supply Fuse)

Fuse specification:

DT Version: 1 x 1 A / 250 V / 5x20 mm (Time Delay Type Fuse)

RM Version: 2 x 1 A / 250 V / 5x20 mm (Time Delay Type Fuse)

FS Version: 1 x 6.3 A / 250 V / 5x20 mm (Time Delay Type Fuse)

4 - Pressure Units Conversion

psi	bar	mbar	mPa	kPa
1	0.06894757	68.94757	0.006894757	6.894757

psi	Pa	atm	at	mmH ₂ O
1	6894.757	0.06804596	0.07030695	703.0890

psi	cmH ₂ O	ftH ₂ O@4°C	inH ₂ O	inH ₂ O@60°F
1	70.30889	2.306726	27.68067	27.70759

psi	torr	mmHg	cmHg	inHg
1	51.71507	51.71507	5.171507	2.036026

psi	inHg@60°F	gf/cm ²	kgf/cm ²	kgf/m ²
1	2.041772	70.30695	0.07030695	703.0695

