

## TAP (TOTAL AIR PREP)



**TAP-3000**



**TAP-1000**

## OPERATING INSTRUCTIONS

## NITRA TAP (Total Air Prep Manual)



Please include the Manual Number and the Manual Issue, both shown below, when communicating with Technical Support regarding this publication.

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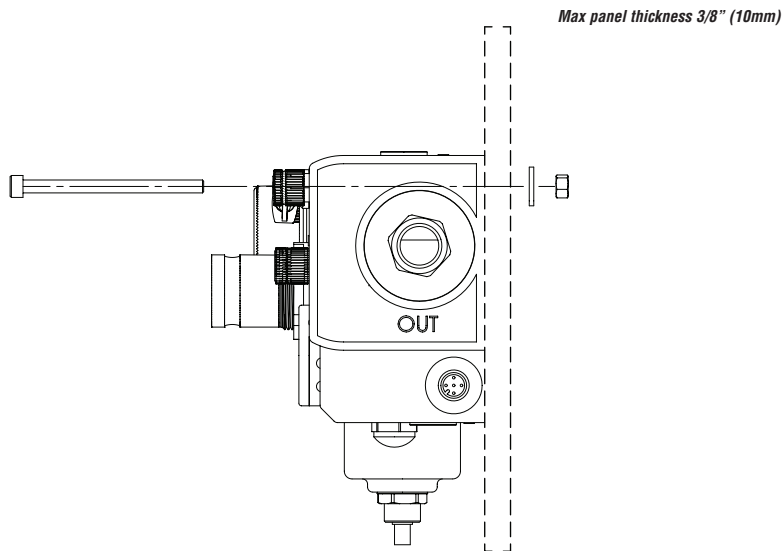
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## 1 - Mounting

### 1.1 Front Mounting

Mount to a panel from the front using the following hardware included with TAP unit:

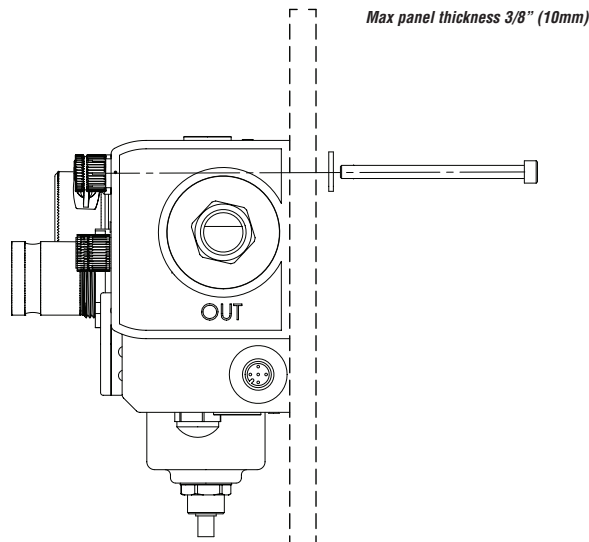
- (2) Socket head cap screws (SHCS) M5 x 75
- (2) washers M5
- (2) nuts M5



### 1.2 Rear Mounting

Mount to a panel from the rear using the following hardware included with the TAP unit:

- (2) Socket head cap screws (SHCS) M6 x 70
- (2) washers M6

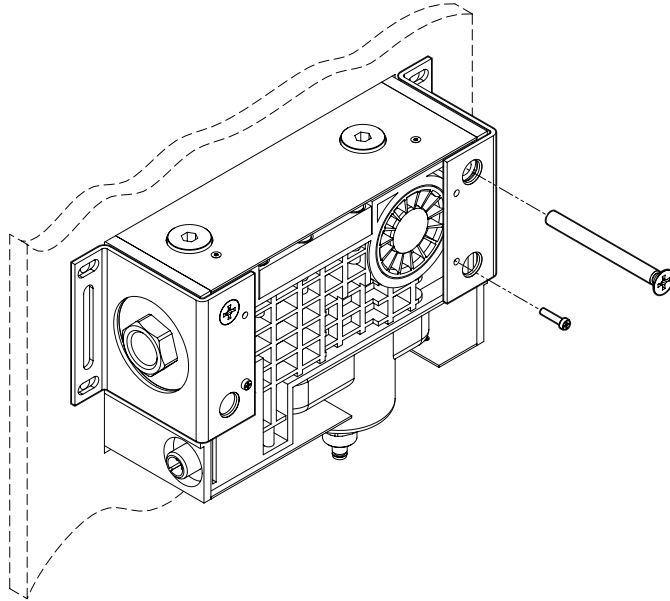


## 1.3 Thru-Panel Mounting

For thru-panel mounting, P/N TAP-ACC01 panel mounting brackets are sold separately.

Mounting brackets include:

- (2) Flat head cap screws (FHCS)
- (2) Thread forming screws

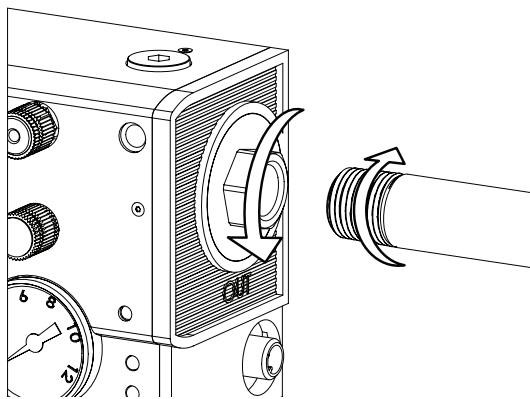


## 2 - Fluid

The TAP (Total Air Prep) units have all been designed for compressed air. No other fluid or media can be used. Non-lubricated air should be used. If there are devices requiring lubrication, it is advisable to install the lubricator downstream of the TAP unit as close as possible to the devices that require lubrication.

## 3 - Threaded Port Connection

Connect the ports to the thread by rotating the fittings or the TAP rotary threaded port as needed. **Do not subject the unit to transversal stresses or tilting torques that may damage the unit.** Use thread sealant or tape on male NPT threads.



## 4 - Auxilliary Air Outlets

### A - Non-regulated filtered air outlet

This is a G 1/4" port situated at the top on the left that takes air downstream of the filter before the regulator and the valves, pressure switches, etc...

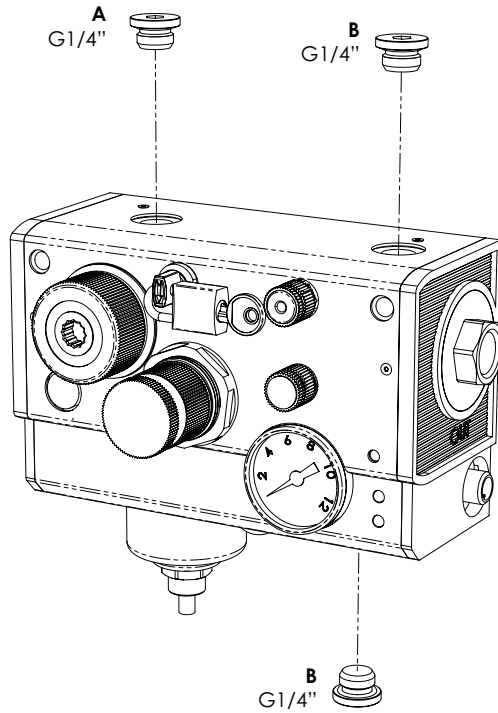
To use it, remove the plug with a 6mm hex key. **Note: shut off the incoming compressed air supply before removing the plug.** If there is no alternate method, unscrew the filter plug, the automatic valve incorporated in the unit will cut off air flow after the filter.

### B - Regulated filtered air outlets

There is a G 1/4" port at the top on the right and one on the bottom right, connected in parallel to the main threaded outlet port. These are downstream of the regulator, the valves, the pressure switch etc...

To use it remove the plug. **Note: shut off the compressed air supply before removing the plug.** Turn the manual shut-off valve to off, or switch off the electric supply to the solenoid valve. If there is no alternate method, unscrew the filter plug, the automatic valve incorporated in the unit will cut off air flow after the filter.





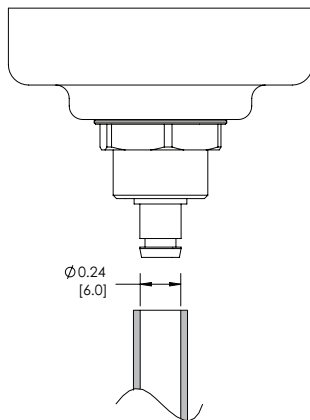
### 5 - Condensate Drain (Semi-Automatic)

An efficient internal system separates most of the water condensate in the compressed air and collects it in a clear bowl at the bottom of the unit. This water has to be drained out.

The condensate is drained out automatically whenever the level in the bowl raises the float valve, as well as, when input pressure is removed and/or pressure is below 3-5 psi.

To carry the water condensate away, use flexible tubing with an internal diameter of 6mm or 1/4" pushed over the drain barb at the bottom of the bowl.

**Note: If the diameter of the tube is too small, or there are bends or bottlenecks, it will be difficult for the water to flow through and the automatic drain will not work properly.**



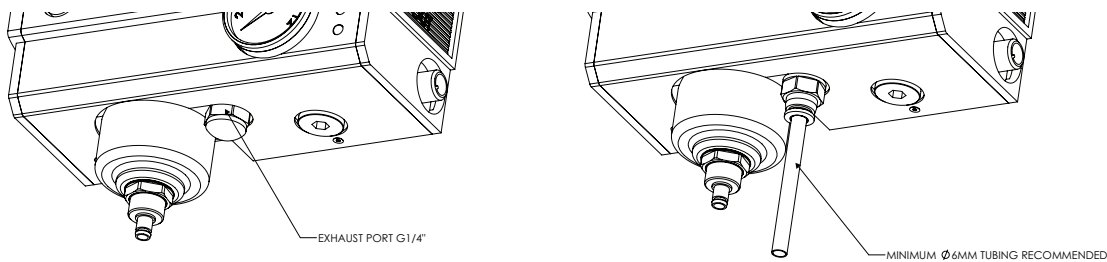
### 6 - Air Exhaust

TAP units have a single compressed air relief valve at the bottom.

Downstream air is discharged when:

1. The manual shut-off valve is closed.
2. The electric shut-off valve or the soft start valve is switched off.
3. The downstream pressure exceeds the setpoint on the regulator.

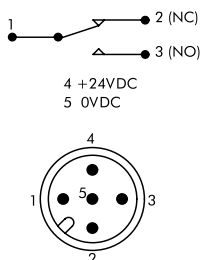
The exhaust is a G 1/4" threaded port, that comes standard with a metal mesh silencer. If the air is to be drained out away from the unit, replace the silencer with a suitable fitting. **A tube with a diameter of at least 6mm or 1/4" is recommended.**



## 7 - Electrical Connection

A single 5-pin M12 connector is used to supply power to the solenoid valve and handle the pressure switch signals.

The pressure switch has short circuit protection resettable by power cycle. In case of activation of short circuit protection, the electrical signal is interrupted but the LEDs stay on.



### Cable Assembly Wiring Colors:

**Pin 1 - Brown**

**Pin 2 - White**

**Pin 3 - Blue**

**Pin 4 - Black**

**Pin 5 - Yellow/Green**

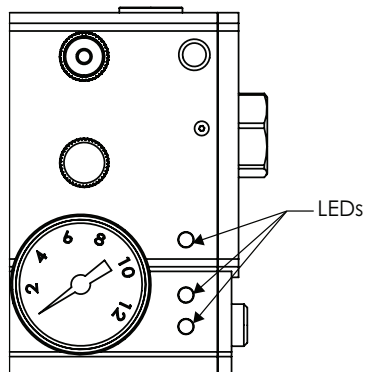
*Note: wiring colors are based on AutomationDirect CD12L and CD12M 5-pole cable assemblies.*

**Version with solenoid valve and pressure switch**

## 8 - LEDs and Function

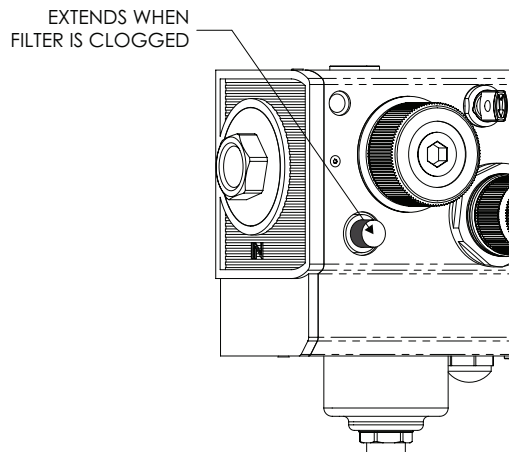
The TAP electrical unit always has three LEDs, but only those associated with the current functions are active.

- **ON: GREEN LED** - This is on if the electric shut-off valve or the soft start valve is powered on.
- **NC: RED LED** - Pressure switch's normally-closed contact. It is on if the actual pressure is lower than the pressure switch setting and if an electrical circuit is connected.
- **NO: YELLOW LED** - Pressure switch's normally-open contact. It is on if the actual pressure is higher than the pressure switch setting and if an electrical circuit is connected.



## 9 - Clogged Filter Signal

Should filter become sufficiently clogged to cause an excessive drop in pressure, the orange indicator will pop out a few millimeters. **It only remains visible while there is effectively a drop in pressure.** If for example the required flow rate drops, the indicator will retract.

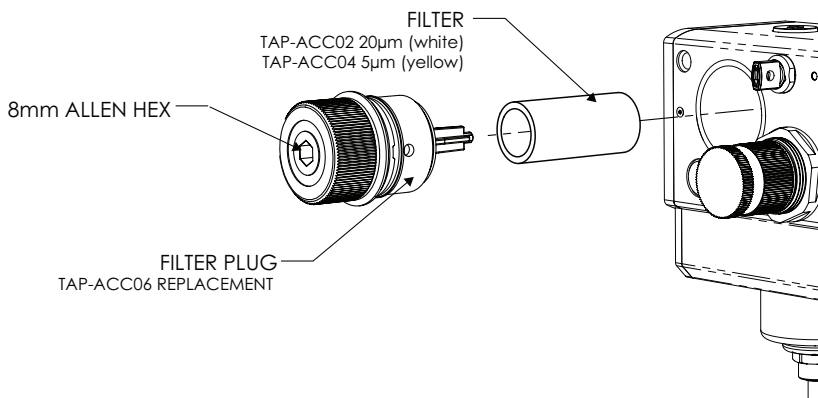


## 10 - Filter

The filter cartridge is positioned horizontally. To replace it, unscrew the plug on the front. The unit will automatically shut off the flow when you remove the plug. There is no need for shutting off the air supply upstream and there is no risk of the plug being blown out.

The air in the cartridge flows outwards, the dirt collects inside the cartridge and does not affect the other internal surfaces. It is always advisable, however, to clean the inside of the unit and the plug with a dry cloth.

**When replacing the plug, tighten it to a maximum torque of 6Nm (53 lb-in), taking care not to damage it. Use an 8mm Allen wrench if necessary.**

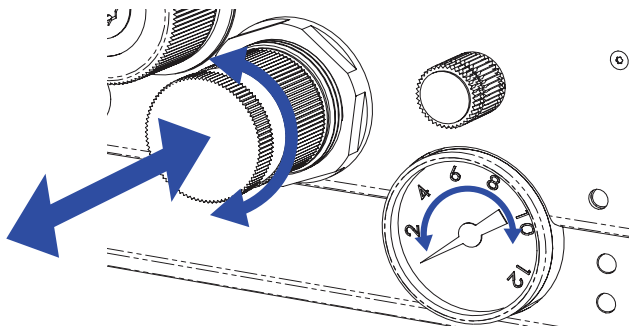


## 11 - Pressure Regulation

1. Pull out the knob to unlock.
2. Turn the knob until you read the desired value on the gauge.
3. Then press the knob to lock it.

Controlled air relief is provided to improve the pressure regulation.

**Note: The pressure must be set while increasing pressure.**



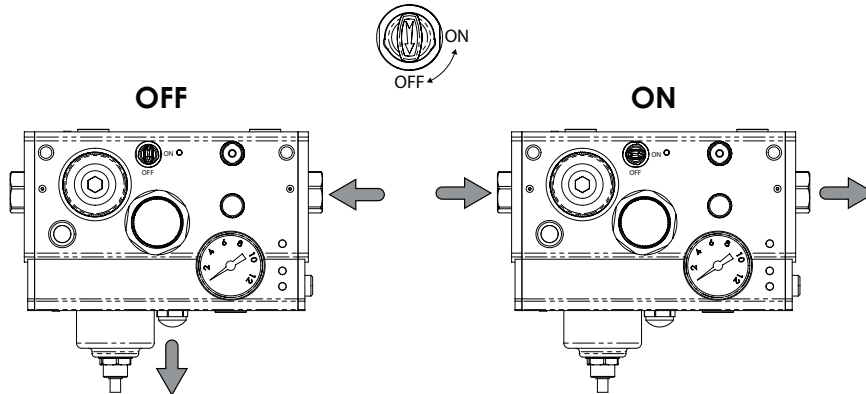
## 12 - Manual Shut-Off Valve

When the valve is in the **On** position, the air supply is enabled.

When the valve is in the **Off** position, the air supply is shut off and the air downstream is relieved.

You can attach the padlock when the valve is in the **Off** position to prevent it from being rotated.

**Note: If there is also an electric Shut-Off or soft start valve, the air supply is only enabled if the power supply is on.**



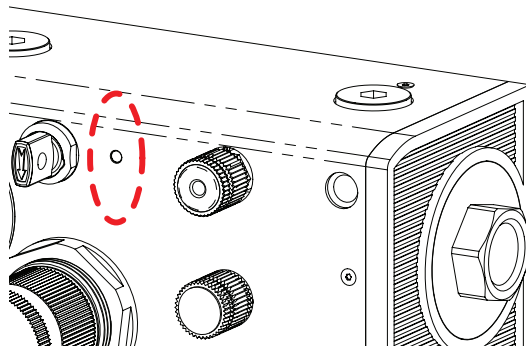
## 13 - Electric Shut-Off Valve

When this valve is powered on, the air supply is enabled.

When the power supply is switched off, the compressed air supply is cut off and the air downstream is relieved.

The valve can also be opened without powering it on by pressing the test button. This is a momentary button which returns to the closed position when released.

**Note: If there is also a manual shut-off valve, the air supply is only enabled if it is in the ON position.**



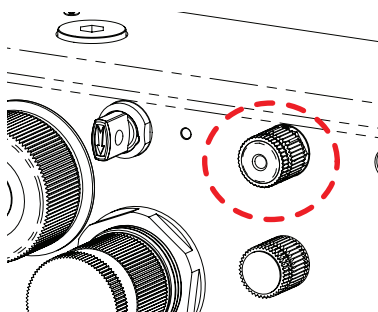
## 14 - Soft Start Valve

On TAP's soft start valve the pressure is increased gradually whatever the flow rate of the supply.

When the solenoid valve is powered on the downstream pressure starts to increase. When it reaches about 30-40% of the set pressure, the valve opens completely and the pressure rises to the set value.

The pressure increase can be regulated with precision via the knob on the front (pull to unlock):

1. Turn in the "Slow" direction to increase the ramp time.  
If you rotate as far as it will go, this cuts off the flow of air completely, and the pressure does not increase.
2. Turn in the "Quick" direction to decrease the time it takes to open the valve.  
If you rotate as far as it will go, the valve will open almost immediately.
3. After adjusting, press the knob to lock it.



## 15 - Pressure Switch

The pressure switch has a switching contact, which means you can have a normally-open signal or a normally-closed signal. It is also connected to the **NC** and **NO** LEDs which come on if the actual pressure is less or greater than the set pressure, respectively. The LEDs only come on if an electric supply (max 0.5 A) is connected to them.

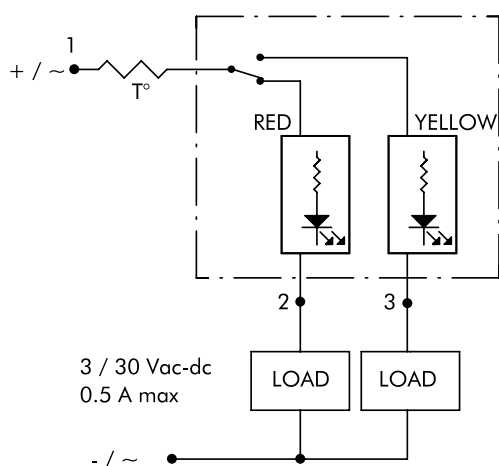
The pressure switch has short circuit protection resettable by power cycle. In case of activation of short circuit protection, the electrical signal is interrupted but the LEDs stay on.

For pressure setting by means of the knurled knob, turn towards “+” to increase the pressure and vice versa.

Proceed as follows to make a correct setting:

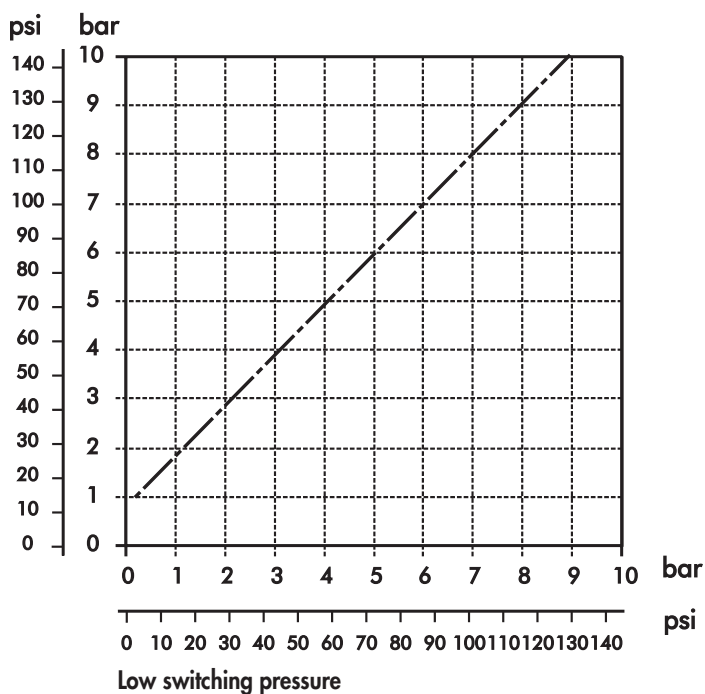
- Turn the knob towards “-” as far as it will go.
- Set the pressure regulator to the value at which you wish the pressure switch to activate and check the gauge. The **NO** LED is on and the **NC** LED is off.
- Turn the knob towards “+” until the unit switches.
- Press the knob to lock it.
- Reset the desired value for normal operation on the pressure regulator.

**PRESSURE SWITCH WIRING DIAGRAM**



**PRESSURE SWITCH HYSTERESIS CHART**

High switching pressure



## 16 - Maintenance

The only routine maintenance required is replacement of the filter cartridge. Refer to the section “Filter” for instructions.

The unit may occasionally require additional maintenance. A few examples and solutions are provided below:

**NOTE: Maintenance must be carried out by properly qualified and trained personnel. Before doing any maintenance, switch off the compressed air supply and cut off the power supply by unscrewing and removing the power cable.**

### 16.1 Regulator

PROBLEM	CAUSE	REMEDY
1.1 The regulator discharges air out the exhaust	Downstream pressure higher than set pressure	The air relief stops when the pressures are balanced
1.2 Perceived very small air discharge from exhaust	The controlled relief of the pilot regulator lets a quantity of audible air through	It's not a defect, but it's normal for these pressure regulators
1.3 The regulator does not reach the required pressure	Upstream pressure lower than set pressure Rated pressure too low  Excessive air flow	Regulate pressure upstream  Check the rating of the regulator  Check the pressure/flow rate charts for the regulator in the catalog
1.4 After an air intake, the pressure is lower than the preset value	Regulator setting in descending order (from high to low pressure)	Pressure must be set in ascending order (from low to high pressure)
1.5 The knob does not rotate	Knob in locked position	Release the knob by pulling it out and then adjust

### 16.2 Filter

PROBLEM	CAUSE	REMEDY
2.2 Decreased flow rate	Filter clogged	Replace the filtering element

### 16.3 Pressure Switch

PROBLEM	CAUSE	REMEDY
3.1 The pressure switch activates too often	The setting value is too close to the regulated	Lower setpoint of the pressure switch
3.2 The knob does not rotate	Knob in locked position	Release the knob by pulling it upwards and then regulate

### 16.4 Shut-Off Valve

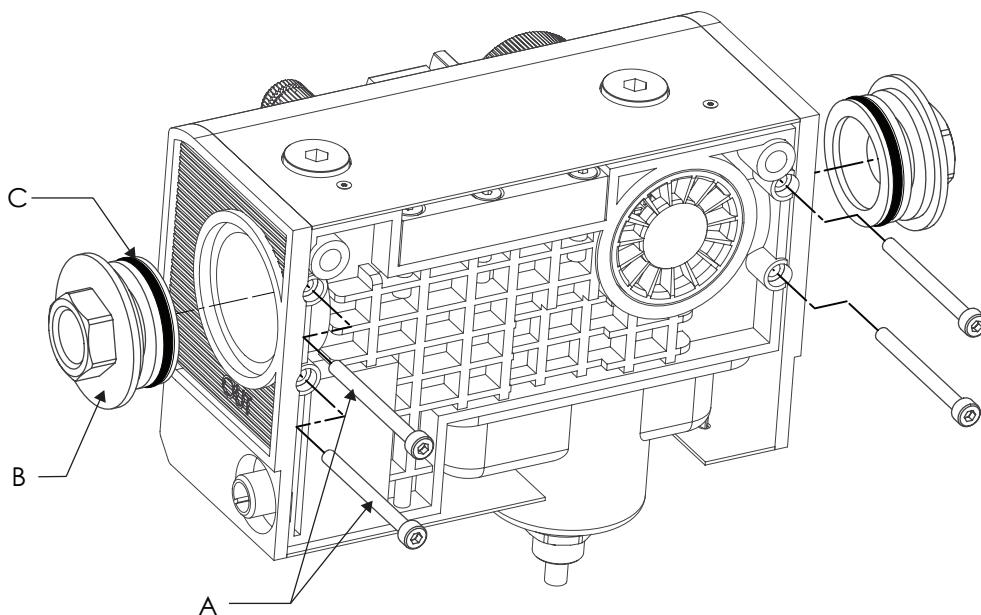
PROBLEM	CAUSE	REMEDY
4.1 No air passes downstream	In the manual version the knob is in OFF position  In the electropneumatic version the solenoid is OFF	Put the knob on the ON position  Verify that the solenoid coil is energized
4.2 The air gets continuously released	The manual shutoff valve is in OFF position	Put the knob on the ON position

### 16.5 Soft Start Valve

PROBLEM	CAUSE	REMEDY
5.1 No air passes downstream	Regulation knob fully closed No electrical control in the electropneumatic version	Turn knob towards "Quicker" Check that the solenoid coil is energized
5.2 The soft start valve does not start (immediate full-port passage of air)	Regulation knob fully open	Turn knob towards "Slower"
5.3 The knob does not rotate	Knob in locked position	Release the knob by pulling it upwards and then regulate
5.4 Interruption of the electrical signal but the LEDs stay on	Short circuit protection	Switch off the power supply and remove the cause of failure

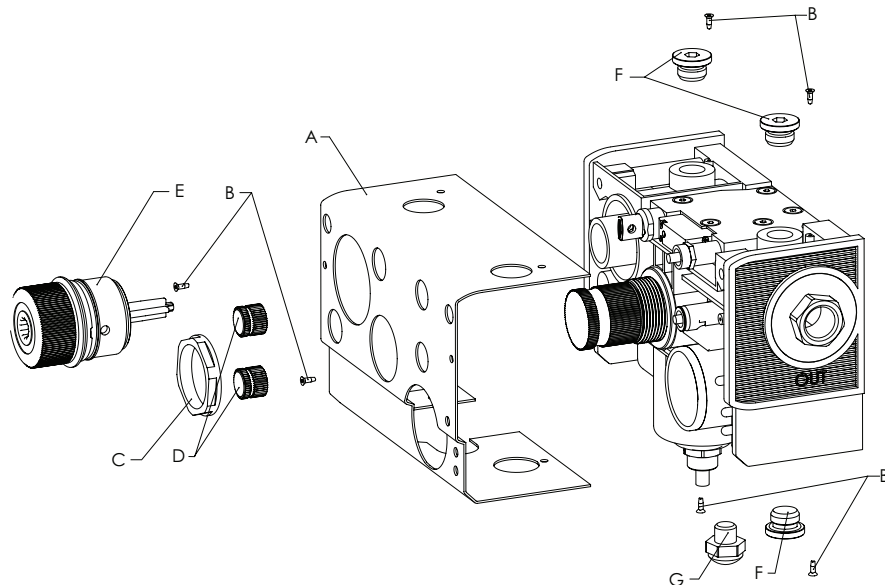
### 17 - Replacing a Threaded Port

1. Unscrew the two SHCS M4 x 45 (A)
2. Extract the threaded port (B)
3. Clean the seat of the body
4. Lube the outer ring seal (C) of the new threaded port with light oil or petroleum jelly
5. Insert the new threaded port
6. Re-tighten the two SHCS M4 x 45 (A) (taking care not to overtighten)



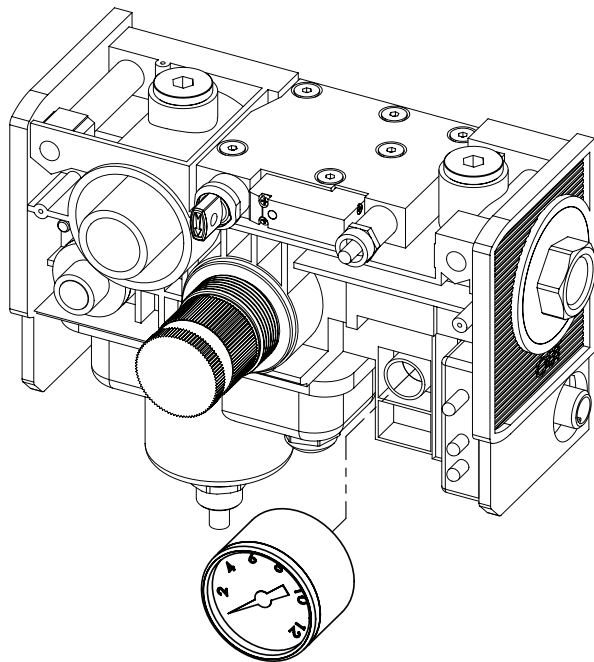
### 18 - How to Remove and Remount the Cover

1. Unscrew the regulator ring nut (C)
2. Unscrew the filter plug (E)
3. Pull off the soft start valve knob (D) and the pressure switch knob (D) taking care not to damage the small spring in the pressure switch. To do this, grip the knob and pull it outwards with force.
4. Unscrew the silencer on the exhaust (G)
5. Remove the G 1/4" plugs (F) or any fittings mounted from the supplementary outputs
6. Unscrew the 2+2+2 screws (B) on the three sides of the guard
7. Remove the guard (A) by pulling it from the front
8. Remount the cover following the above operations in the reverse order



## 19 - Replacing the Pressure Gauge

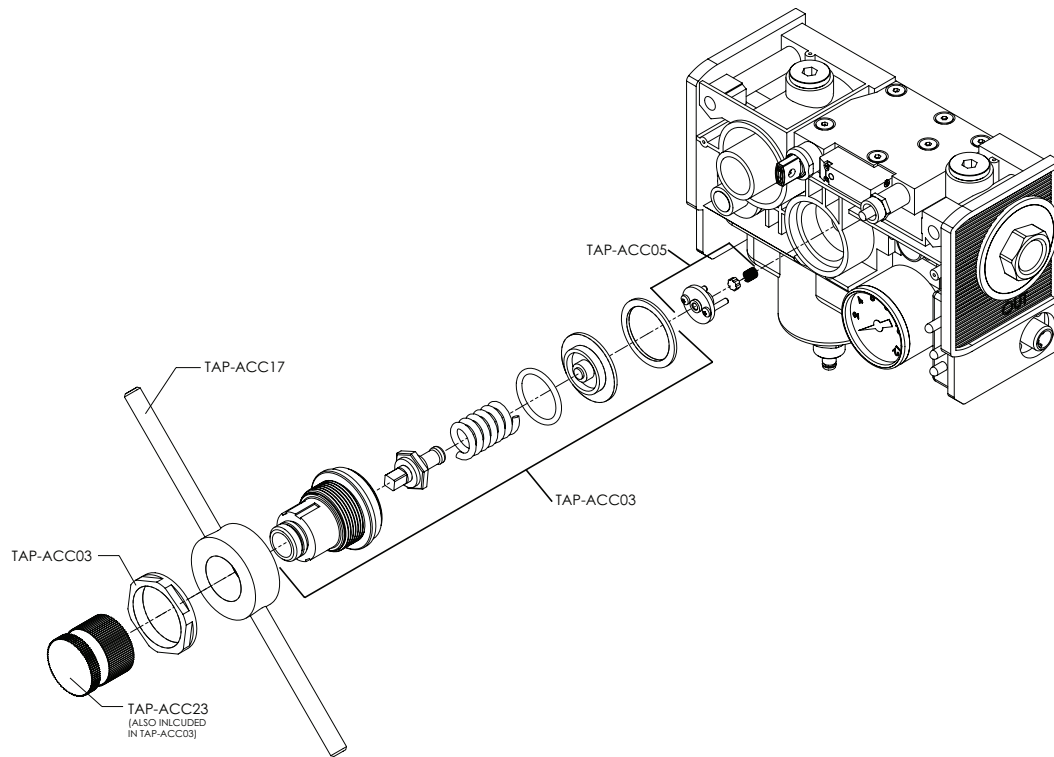
1. Remove the cover
2. Unscrew the pressure gauge
3. Apply some removable sealant on the thread of the replacement pressure gauge for example Loctite® 242E or 542
4. Screw on the new pressure gauge, making sure the markings are horizontal
5. Remount the cover



## 20 - Replacing the Pressure Regulator

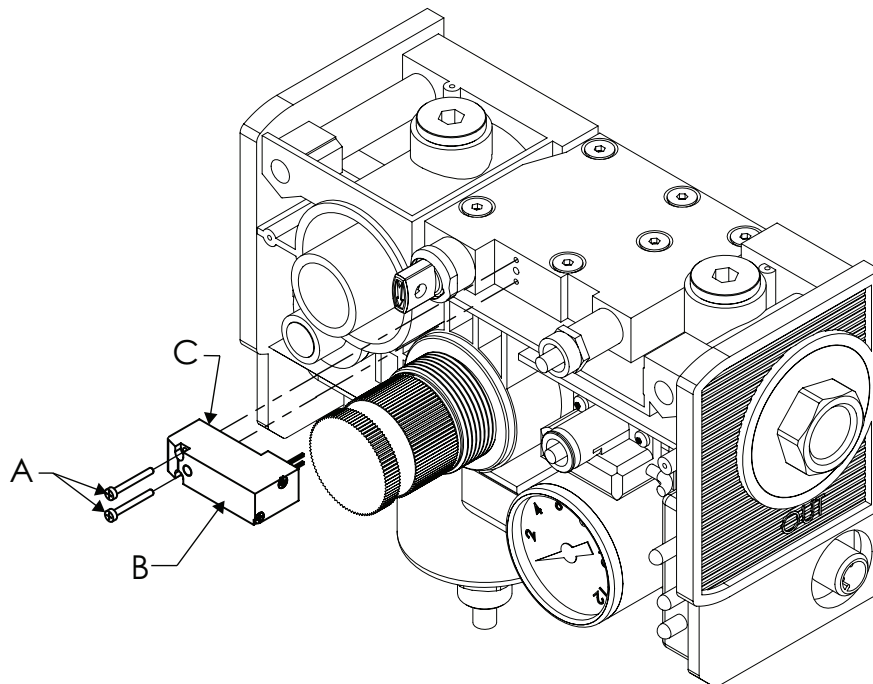
1. Remove the cover
2. Remove the regulator knob (TAP-ACC23)
3. Unscrew the bell (TAP-ACC03) using the wrench (TAP-ACC17)
4. Remove all the components for the pilot regulator (TAP-ACC05)
5. Install the new parts ensuring that all pieces are replaced in the order in which they were taken apart
6. Remount the cover





## 21 - Replacing the Solenoid Valve

1. Remove the cover
2. Unscrew the 2 screws in the solenoid valve (A)
3. Replace the solenoid valve (B), ensuring that the gasket (C) seats correctly in position. If necessary, wet the gasket or oil it slightly
4. Remount the cover



## 22 - Other Maintenance

Within this manual it is described how to replace component spare parts. No other maintenance should be required during the life of the unit. It is important to remember that all TAP components can be disassembled. Therefore, at the end of its operating life, the working internal parts could be recycled. If the unit requires maintenance not covered within this manual, please contact [AutomationDirect.com](http://AutomationDirect.com) Technical Support at 1-800-633-0405. They will advise further technical details or directions.