For Gas Supplier
and Gas Equipment Installers

Automatic Changeover Regulator with Over Pressure Shut Off (OPSO)

INSTRUCTION MANUAL

This instruction manual describes the correct way of operating and handling regulators. It is intended for distributors of liquefied petroleum gas (LP gas) as well as workers who carry out gas pipe fitting.

To ensure that customers are able to use LP gas comfortably and safely, please observe all the relevant laws and regulations and read this manual carefully. Make sure that the LP gas system is perfectly safe by complying with these instructions.

After you have read the manual, be sure to keep it handy, so you can consult it whenever you need to.

This product must only be fitted by persons with the necessary competence in relation to the type of gas used.

What the symbols in this manual stand for:

⚠ WARNING	Incorrect handling can lead to a grave result, such as death or a serious injury.
⚠ CAUTION	Incorrect handling can lead to injury to humans and/or damage to property, such as to a house or furniture.

	Be sure to comply with the following.
	This means prohibited action.
	Keep away from fire.

I·T·O Corporation

1. Description of Product

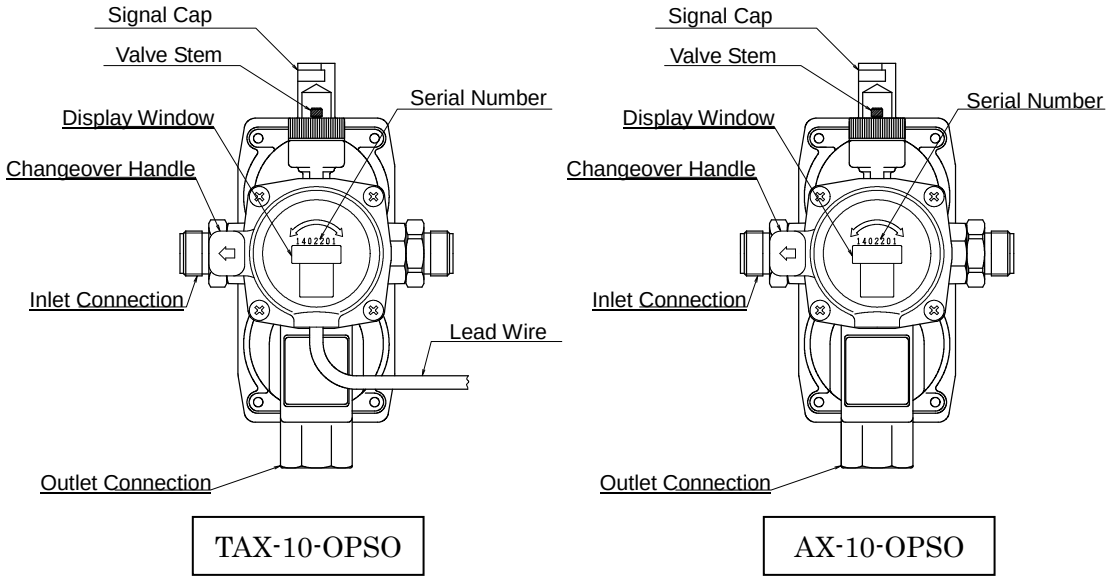
This Automatic Changeover Regulator regulates the pressure of liquefied petroleum gas. This integrated two-stage regulator combines a first-stage regulator and a second-stage regulator into a single unit. The product regulates highly pressurized LP gas by reducing its pressure and supplies the combustion devices with gas at the correct pressure. In addition, in the event that the LP gas supplied from the service side fails to maintain the correct supply pressure, the regulator's automatic changeover function automatically makes the reserve side supply supplementary gas.

Moreover, the TAX series regulators contain a switch interlocked with the signal's "Red" display, which activates when the gas supply from the reserve side begins. This mechanism sends a signal to an appropriate automatic notification device to say that the reserve side is now operating and therefore the supply side has been emptied.
Choose the regulator having the capacity that is suited to the LP gas consumption of the equipment.

Non return valve has been installed on this Automatic Changeover Regulator to prevent the gas leakage from the inlet connection into the atmosphere in the event of replacing the cylinder.

In addition, this regulator has a safety valve that releases gas to the atmosphere and an over pressure shut off valve (hereinafter referred to as OPSO) that completely stops the flow of gas when the outlet pressure rises above normal range.

■Part names



【SERIAL NUMBER】

Example : 140201

Production in Feb/2014

■**Product Specifications**

Model	(T)AX-10-OPSO
Gas Type	Propane
Inlet Pressure Range	1.0~16bar (0.10~1.60MPa)
Outlet Pressure	37mbar (3.70kPa)
Flow rate	10kg/h
Working Tempature Range	-20~50℃
Inlet Connection	M20×1.5
Outlet Connection	Rp1/2
Safety Valve Working Pressure	74~89mbar (7.40~8.90kPa)
OPSO Working Pressure	90~110mbar(9.00~11.0kPa)
Starting Pressure of Replenishment	500mbar(50.0kPa) and over

BS EN16129:2013

■**Specifications** **(feature of the embedded switch of the model TAX which features a signal transmitting function)**

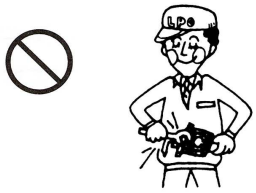
Model		Signal self-holding type *Note
Actuating Method		Pressure detection using a diaphragm, a permanent magnet and a reed switch
Reset Method		Manual resetting in conjuction with switching handle
Signal Output		No-voltage a-contact
Contact Point Specification	Max On/Off Allowable Voltage	DC-100V
	Max On/Off Allowable Current	DC-0.25A
	Contact Resistance	1Ωless than
Lead Wire		VCTF 0.5mm^2(2C)×100cm

*Note: Signals from the models with the signal transmitting function (TAX) are self-holding in order to prevent chattering. Once the signal indicates “Red”, ・it does not turn back to “White” unless it is reset. (To reset the signal, use the changeover handle.)

2. Safety Precautions

WARNING

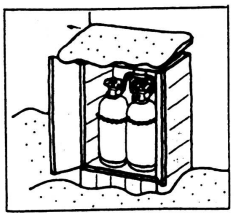
This regulator is designed for use with LP gas only. Never use it with any other kind of gas, since such use can damage the regulator’s functions. Use only with gas type noted on the product data plate. This regulator must only be used in vapour phase, it must never be used with liquid phase.



The regulator has been assembled with precision at our plant. Any disassembling and/or modification of the regulator could result in an accident. Never attempt to disassemble or modify the regulator.

Shock to the regulator can result in gas leakage and other accidents. Never hit it, strike it with an object, drop a heavy object onto it, or apply any other shock to it.

If you install the regulator in a place susceptible to snow damage, be sure to protect it by installing it inside a protective cabinet, etc.

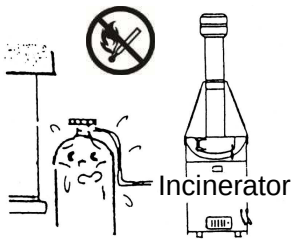


This regulator has a safety valve that lets gas out in the event the gas pressure rises above the normal level. Be sure to install it, therefore, in an outdoor location away from any external sources of ignition.
(Please secure the isolation distance according to related regulations in a country the product installed.)

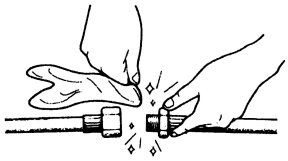
3. Installation Works

WARNING

- When installing the regulator, be sure to observe the relevant laws and regulations of the country where it is used.
- Never install the regulator close to any external sources of ignition.
- Do not install the regulator in an environment where it could be exposed to harmful gases, such as ammonia, ozone, sulfurous acid, etc.

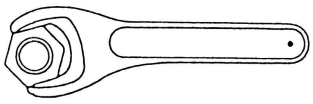


- The automatic change-over should preferably installed outdoors (see local legislation) and be protected from rain and snow and from all other agents (i.e.snow, dust).
- Before connecting the regulator to a pipe, etc., be sure to remove any foreign substances (such as fine chips, cutting oil, dust, etc.) completely from the screw threads, to prevent gas leakage and other accidents.



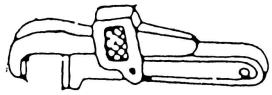
Remove any foreign substances from the connecting section

- When connecting the regulator to a pipe, etc., never apply a pipe wrench directly to the main body of the regulator. To screw a pipe, etc. onto the regulator, use a spanner or an adjustable wrench and apply the appropriate level of force.



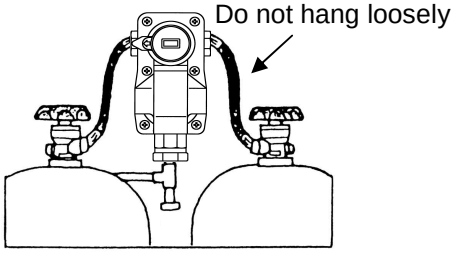
Use a spanner.

- When connecting the low-pressure section, be sure to apply LP gas-resistant sealant specifically formulated for low pressure sealing (non-drying).
- Do not apply sealant and sealing tape together, since this can lead to excessive force being applied to the regulator's connecting section, thereby damaging it.



Do not tighten with a pipe wrench

- Support and fix the piping and manifolds at the inlet and outlet with pipe hanger or stands or the like.
- When the product is fixed on a wall, please put an isolating packing between the surface of the wall and the fixed plate of the product in order to be insulated from the wall.
- Do not expose the product or piping to excessive force.
- Be sure to use gaskets that are suitable for the connections.
- Do not install the regulator below the level of the cylinder valves to prevent the re-liquefaction gas from entering the product, and do not hang the hose connected to the regulator loosely.



- The outlet of the regulator must always be facing downwards.

≪For a regulator with the signal transmitting function TAX-10-OPSO≫

WARNING

Do not use any electrical device which has specifications incompatible with those of the embedded switch.

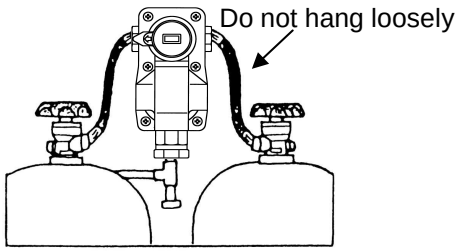
Take appropriate measures to prevent rainwater, etc. from entering.

Please refer to the related regulations in a country the product installed.

4. Air-tightness Test and Operation Check

CAUTION

After installation of the regulator is complete, be sure to conduct an air-tightness test for the gas piping and confirm there is no gas leakage.



To begin using the gas, first slowly open the inlet side cylinder valves and then the outlet valve. “Rushed” opening/closing of a valve can damage it. Be sure to open or close a valve slowly.

Then, confirm there are no external sources of ignition in the vicinity. Next, use LP gas to purge inactive gas from the piping.

Let a single burner combust the gas. While the burner is doing this, close the valve on the cylinder of the service side to shut off the gas supply. Then, confirm that the indicator window (signal) turns red. Also, operate the changeover handle alternately to confirm that gas is automatically supplied from the reserve side. If this automatic supply works, the regulator’s auto-changeover function is operating normally. In the case of the TAX series, in particular, repeat closing and opening the valve on the cylinder of the service side to confirm that the signal remains red, as this indicates that the self-holding function is operating normally.

Turn the changeover handle until it clicks. If the changeover handle is not sufficiently turned, the TAX series in particular, the embedded switch cannot be turned ON and it stops sending a signal.

Also confirm that the gas ignited in the burner burns normally and that gas replacement is taking place normally. Thus, confirm that the regulator is functioning appropriately and correctly.

Stop using the gas and confirm the lockup pressure is 50mbar or less.

Confirm that the changeover works correctly, the indicator’s display is correct, and the switch works properly (conduction).

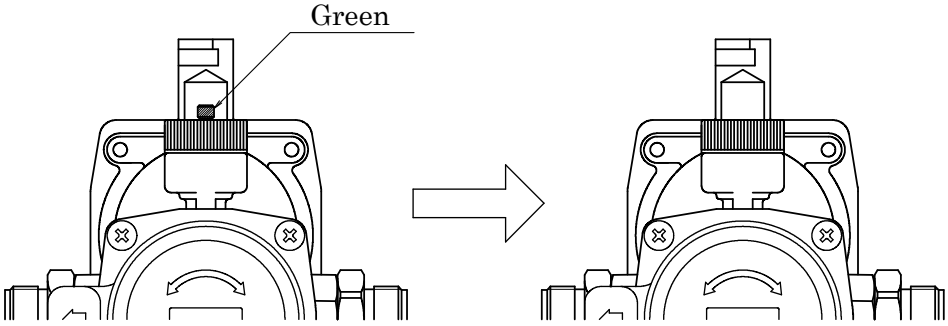
Indicator window	State of supply	Transmitting function (state of switch)
————	Being supplied by the service side cylinder pointed to by changeover handle.	OFF
RED	Being supplied by the reserve cylinder opposite to the Handle Point.	ON

5. The OPSO working situation

<The working of the OPSO>

In the case that the outlet pressure of the regulator rises above normal pressure range, the OPSO works and stops gas flow.

When the OPSO is operating, the green part of the valve stem, which can be seen in the signal cap, becomes invisible.



Normal Situation　　OPSO Working Situation

❗ In the case that the OPSO works, close cylinder valves and immediately contact gas delivery agent.

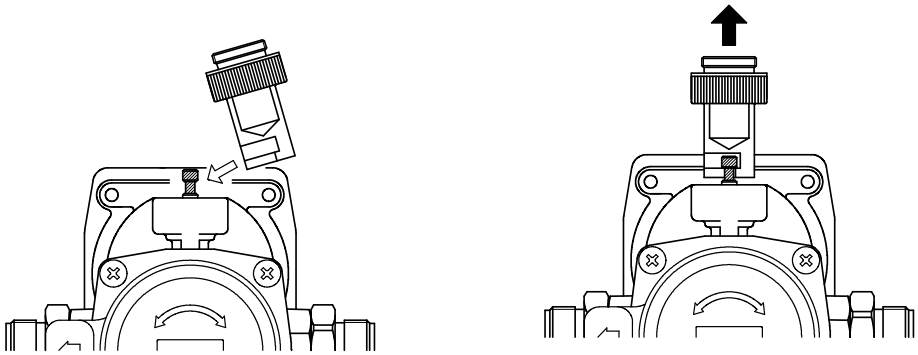
Remove the cause of the abnormal rise of the outlet pressure, and then reset the OPSO.

<Reset Method>

When you reset the OPSO and restart the gas supply, pull up the signal cap until it clicks, by inserting the top of the valve stem into the hole of the signal cap.

After checking that the valve stem has returned to the normal position and the pressure in the outlet pipe is normal, put the signal cap back in its original position.

Slowly open the inlet cylinder valves and then open the outlet valve.



❗ When resetting the OPSO, do it after checking all the gas equipment installed on the downstream of the product is closed.

6. Maintenance

⚠ CAUTION

❗ Before you replace a cylinder, check the changeover handle to confirm which side is currently in service.

❗ Turn the changeover handle to switch the reserve side over to the service side. Then, take the cylinder off the former service side and replace it with a new filled cylinder.

Secure the new cylinder's position and orientation. Then, check the condition and placement of the washer in the hose nut and then connect the high-pressure hose to the cylinder.

- Checking for gas leakage with gas leakage detecting liquid or soapy water.
  *Never check for leakage with a naked flame.
- When replacing a cylinder, be careful to prevent any sand, fine particles, moisture, etc. from entering the cylinder.
- After replacing a cylinder, confirm that the changeover handle is in the correct position, the display of the service side and reserve side is normal, etc., and use soapy water or gas leakage detecting liquid to confirm that no gas is leaking from any of the connecting sections of the regulator and the cylinders.
- If there is a possibility that rainwater, snow, etc. enter the regulator vent and then freeze, apply some means of protection (vinyl wrap, etc.) to prevent this.
- The operating life of the regulator is about ten years.
  Please exchange it for the new regulator within ten years period from the manufacturing date.
- If the regulator is found to be abnormal in any way, replace it with a new one to ensure safe operation.
- When replacing a cylinder, confirm that the regulator has no corrosion, cracks, loose screw, damage, etc. that can affect use.

≪Outlet gas valve Instruction ≫

CAUTION

To prevent gas leakage, follow all the instructions below:

- Never use this valve for any kind of gas other than LP gas.
- Never disassemble or modify it.
- If the handle has become stiff, do not hit it with a hammer, etc. in attempt to make it turn.
- Be careful not to let flame and/or heat radiation raise the temperature of the valve.

CAUTION

Safety instructions:

- This valve must always be used in either "fully open" or "fully closed" mode.
- When you are not using gas for a long period, close the valve handle.
- Keep this valve away from any other object to prevent it from being closed by accident.
- In the event gas leakage or any other abnormality is detected, stop using the gas immediately and contact your gas supplier.

7. Warranty of Product

CAUTION

We will warrant the product for two years from the date of manufacture, subject to the following:

①The product will be repaired or replaced with a new one at no charge if the failure arises after normal usage procedures in conformity with this manual.

②Repair or replacement will be performed at cost, even within the warranty period, if the failure is attributable to one of the following causes:

1) Problems and / or damage arising from incorrect use, improper repair or conversion
2) Problems and / or damage arising from dropping, impact shock or similar.
3) Problems and / or damage arising from failure to follow the instructions in this manual, e.g.: ignoring periodic inspections
4) Problems arising from foreign bodies from upstream pipelines. (Including insufficiency of lockup function, clogging of strainer, etc.)

8. Exclusions

①Our Company does not have any liability and/or responsibility for any damage and/or damages caused by force majeure such as natural disasters (including storms, flood damage, earthquakes and lightings), fires, environmental pollution (unusual circumstances), salt damage or Air pollution including atmosphere contaminated with gases other than normal air.

②Our Company does not have any liability and/or responsibility for any damage and/or damages caused by acts of a third party, any other accidents, a customer's intentional or unintentional misuse of the product, or its use under any other abnormal conditions.

③Our Company does not have any liability and/or responsibility for any incidental damages (losses of profit, interruption of business, etc.) caused by use or non-use of the equipment.

④Our Company does not have any liability and/or responsibility for any damage and/or damages that may be brought about by uses other than those explained in this instruction manual.

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Note : Specifications and appearance of the product described here may be changed without prior notice.

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