

**Low Pressure  
Automatic Changeover  
5185 - Compact 800 OPSO**



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**Compact 800 OPSO with CSR (Consumer Safety Reset)**

*\*Normally supplied in UK with two connection hoses and manual isolation ball valve*

**1- Application**

In LPG (Propane, Butane or mixture) installations using 2 cylinders (fig. 1) or 2 groups of cylinders (fig. 2), where the automatic changeover provides continuous gas delivery by preferentially using one group of cylinders (service), until insufficient gas pressure remains to satisfy the consumer appliance demand. Then switching automatically to the other group of cylinders (reserve) to ensuring continuous supply of gas exists without interruption or inconvenience to the consumer and the cylinders have been effectively emptied.

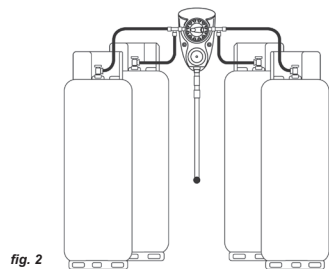
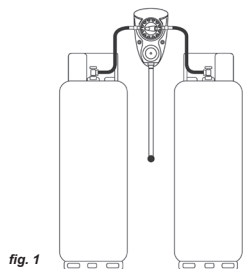
**Note:** in the further text, in order to simplify the reading, we refer only to 2 cylinders installations. In case of an installation with 2 groups of cylinders, the word "cylinder" will have to be understood as "group of cylinders".

The automatic change-over allows the off-take of gas firstly from the service cylinder ("SERVICE" - fig.10), then off-takes gas from the reserve cylinder ("RESERVE" - fig.10) only when the service one is not able to supply the requested flow rate. An indicator (B) built in the hand-wheel (C), informs on the functioning state. When it shows red, it indicates that gas is currently being supplied totally or partially from the reserve cylinder.

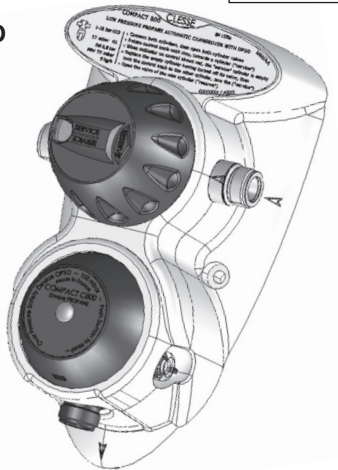
**This automatic changeover combines**

- First and Second stage regulation functions allowing connection directly to the installation pipework supplying the appliances – Note : always check the automatic changeover outlet pressure meets the requirements of all appliances supplied.
- Safety features built-in 2nd stage regulator a) Pressure Relief Valve marked "PRV" and b) Over Pressure Shut Off "OPSO" also described in this document as Consumer Safety Reset "CSR".

Normal design operating temperatures: -20°C/+50°C



ENGLISH



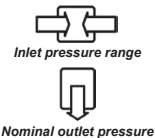
**Warnings:**

- This automatic change-over must be used only with vapour phase LPG and be positioned above the gas cylinders as indicated in Fig 1 and 2. It must not be used with cylinders supplying liquid phase LPG.
- The number and type of cylinders, the type of gas used, the location of the installation, the pressures and the type of safety devices may be subject to local rules and safety restrictions applicable to the country or region of installation. Please refer to them.
- When, no cylinder is connected to one of the inlet connections, the automatic change-over still provides the regulating function. For safety reasons, the non-used inlet shall be sealed with an appropriate cap (available from Clesse).
- In UK, the Gas Safety (Installation & Use) Regulations 1998 require having Over Pressure Shut Off (OPSO) protection on any installation with four or more cylinders, (also suitable for 2 cylinder installations). This automatic change-over is fitted with an integral OPSO. It should be used with a Clesse upgrade connection kit from 2 to 4 cylinders supplied separately or as a 4 cylinder kit.

**2 – Features and Markings**

The following characteristics are displayed on the product (A):

- Inlet pressure range, marked as shown:
- Nominal outlet pressure, marked as shown:
- Change-over pressure, marked "Pdi"



**Note:** Pdi - It is the nominal outlet pressure of the internal change-over function when operating on the "SERVICE" cylinder.

- Guaranteed flow rate in kilograms per hour kg/h (you can convert this to kilowatts by multiplying by 13.9 or 47,500 to give Btu)
- European code of inlet (G...) and outlet (H...) connection

**Note:** only if they are described in EN13786 standard.

- The presence (marked "PRV") and the opening pressure of a pressure relief valve on the built-in 2d stage regulator.
- The presence (marked OPSO) and the closing pressure of this device

Both inlets connections are equipped with:

- non-return valves which prevent any leakage during cylinder changing.
- filters, which prevent the ingress of any debris.

Certain models can be equipped with accessories such as manual operating valve and/or pressure test point.

The dimensions are shown on fig 3 & 4

**Note that the dimensions between the connections are approximated as they depend on the type of connection.**

**3 - Automatic change-over functioning**

**3.1 - Type of gas in the cylinders**

LPG (liquefied petroleum gas) contained in the cylinders is composed mainly with butane and propane. It contains also, in minor quantity, other hydrocarbons.

Depending on the country and the gas distributors, 3 types of gas are generally marketed:

- Commercial butane, which contains approximately 80% of butane
- Commercial propane, which contains approximately 80% propane
- LPG mix, which contains an undefined mixture of butane and propane.

**3.2 - Vaporisation in the cylinder**

In a cylinder (fig 5), LPG is liquid at the bottom and vapour under pressure at the top. When there is an off-take of gas (fig 6), the gas volume is regenerated by boiling of the liquid part. This vaporisation cools down the liquid. The liquid is then heated up by the cylinder wall in contact with atmosphere.

Note that hydrocarbon components delivering high pressure (propane) vaporise faster than those delivering low pressure (butane).

**3. 3 - Pressure in cylinder**

The pressure in the cylinder depends only on the composition and temperature of LPG at any instant. The graph (fig 7) shows the pressure in the cylinder for butane and propane.

During off-take, the temperature decreases, then the pressure decreases.

When only a small amount of liquid remains in the cylinder, the pressure is lower than

when the cylinder was full. This is due to the preferential vaporisation of hydrocarbons delivering higher pressure.

**3.4 - Typical Flow rate capacity of cylinders**

The maximum flow rate depends on: the type of gas, the level in the cylinder, the ambient temperature, the using time, the dimension and material of the cylinder, the number of cylinder.

Table in fig 7, shows typical flow rate capacity for various sized load steel cylinders, half full, depending on type of gas (butane or propane), temperature and using time.

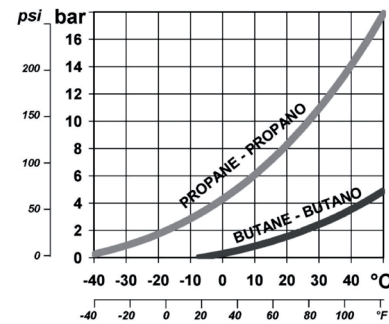


fig. 7

**Table 1 Offtake rates quoted are approximate to supply normal intermittent and continuous loads**

	Cylinder size kg	Offtake rate kg/h per cylinder	Offtake rate kW per cylinder
Butane	15kg	0.70kg/h	9.70
	13kg	1.05kg/h	14.60
Propane	19kg	1.32kg/h	18.35
	47kg	2.32kg/h	32.94



fig. 10

**3.5 - Automatic change-over function (refer to fig. 10)**

The arrow (D) embossed in the hand wheel indicates the "SERVICE" cylinder. The other cylinder is the "RESERVE" one.

When the pressure in the "SERVICE" cylinder is sufficient, the entire flow rate is delivered by the cylinder. When the pressure becomes insufficient, the flow rate is delivered -

- from both "SERVICE" and "RESERVE" cylinders (at the very end of the "SERVICE" cylinder contents),
- in totality from the "RESERVE" cylinder (when the "SERVICE" cylinder is empty),

In any condition, if the "SERVICE" and "RESERVE" are of identical type, the "SERVICE" cylinder will empty before the "RESERVE" one.

The indicator (B) shows red when the "SERVICE" cylinder doesn't deliver the entire flow.

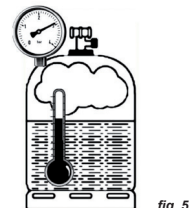


fig. 5

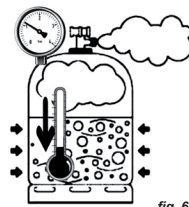


fig. 6

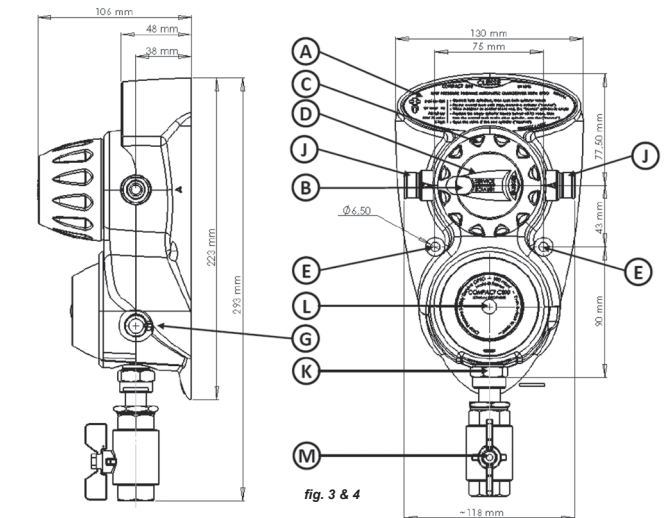


fig. 3 & 4

## 4 - Safety devices

### 4.1 - Pressure relief valve

The pressure relief valve is integral to the low pressure built-in regulator. It allows relief of possible over-pressure that may result from small dirt or debris on the regulator seat or from thermal expansion of the gas

It is marked "PRV" on the product including the set value (A) on the data plate.

Warning: gas may be relieved from this valve. All necessary pre-cautions must be taken to prevent any risk of discharge into property or any restricted area, therefore this installation must be in accordance with local standards and fitted outdoors in well ventilated area.

### 4.2 - Over Pressure Shut Off

The OPISO is fitted is to the low pressure built-in regulator with external indicator and push button to reset the safety device (G).

The device is the final safety protection to ensure downstream pipework and appliances are protected from abnormal increase of pressure, due to circumstances such as liquid LPG entering the regulator, dirt or debris on regulator seat, excessive thermal expansion or impact on the regulator or other abnormal operation or setting of the regulator. Should any of the abnormal conditions be present the device will activate and close off the gas supply to protect the down stream installation and appliances.

**OPISO indication** – To verify that the OPISO has activated in event of no gas downstream of the regulator –

View the clear plastic reset push button using "side on" angle of viewing indicated in fig.11. If the OPISO has activated then a red mark will be visible through the clear plastic push button (G). If nothing is visible then it is likely that the device has not activated and that there may be other reasons why there is no gas downstream of the regulator – The gas cylinder valve closed, no gas left in cylinder, blocked cylinder connecting hose due to excess flow intervention, blocked inlet filter to Changeover (J) or appliance fault (flame supervision device).

### Consideration before resetting of OPISO – CSR Customer Safety Reset -

If the indication inside the push button (G) shows red then the OPISO safety device will need to be reset. Bare in mind that this could have been due to an abnormal situation and therefore consideration should be given to have the gas system checked by a competent registered gas installer if the safety device continues to operate after a consumer reset. **DO NOT CONTINUE TO USE**, turn off at the cylinder valves and ECV valve (M) and contact your competent registered gas installer.

### To reset the OPISO

Remove the sealing wire if fitted (normally performing reset after installation) (H).

- if connected to cylinders turn off cylinder valves

- if connected to down stream pipework ensure every gas appliances is turned off and turn on the ECV valve (M) and valve handle is in the vertical position directly in-line with the pipework.

- hold the regulator with both hands and push the OPISO reset button (G) firmly with thumb until the button engages and pushes open the internal latching mechanism, the resistance ease and continue to push the button until it stops, the distance of travel will be 7mm until the OPISO is fully latched.

- Release the button (G) which will return to its normal position and if successful there should be no red indicator visible when viewed fig.11

- Slowly reopen the cylinder valve one at a time – it is import that there is no instant and excessive surge of gas into the automatic changeover as this may trigger the OPISO mechanism to shut, or cause excess flows valves built into the hose tail connections to prevent high pressure gas from flowing into the automatic changeover head.

- Once the safety systems are re-established proceed to turn on, relight pilot lights or commission gas appliances when first installed or serviced.

- Fit the wire seal (H) supplied on a new installation or equivalent if resetting after the installation. if available.

- If after resetting the OPISO continues to trip/ shut off DO NOT CONTINUE TO USE, turn off at the cylinder valves and ECV valve (M) and contact your competent registered gas installer.

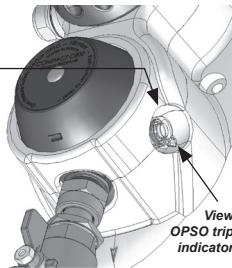
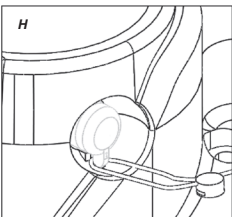


fig. 11



## 5 - Optional accessories

- Pressure test point should be fitted after the ECV valve (M) that enable the gas installer to measure regulated pressure downstream of the automatic changeover. Various types are available from your Clesse distributor.

- Additional cylinders 2 to 4 cylinder upgrade kit – the automatic changeover is normally supplied for installation onto two cylinders. Depending on the appliance load and frequency of cylinder exchange additional cylinders may be added and the Clesse upgrade kit will be required containing two tee pieces and two extra long hoses.

## 6 - Warnings before installation

Note that LPG gases can be dangerous and may cause serious injury, if not handled correctly.

Installation, inspection and maintenance must be performed by persons with the necessary competence, in relation to the type of gas and required usage.

The installation must be performed, inspected, used and maintained in conformity with the laws in force in the country of installation- for example BS 5482 - 2005 part 1 to 3.

The number and the type of cylinders ("SERVICE" and "RESERVE") must be chosen in such a way to supply the requested flow rate, in accordance with the requirements of the demands of installation and ambient temperatures.

Make sure that cylinder and installation valves are closed and that no sources of ignition are nearby. If present, thoroughly clean (blow through) upstream tubing and check all appliances for correct installation practice and refer to manufacturers data plate and instructions for the correct delivery of gas pressure and consumption.

Check the condition and depending on countries the expiry, replacement or production date of the flexible cylinder hoses. Replace them, if necessary.

If they are used in the installation (connector with a nut and washer), check the presence of the gasket and its integrity. Replace it if necessary.

## 7 - Automatic change-over installation

The automatic change-over should preferably be installed outdoors (see local legislation) and be protected from flooding, build up of snow and from all other agents (i.e. dust, mortar).

In a touring or motor-caravan or in-land waterways boat, it shall be installed in the ventilated cylinder compartment.

Its position shall be higher than the cylinder valves and the outlet connection valve must be orientated vertically downward. All upstream tubes and pigtaills shall have a steady fall back to the cylinders and their length shall not be excessively long Fig 1,2, and 9.

The automatic change-over shall be fitted on a wall, or suitable vertical surface, using 2 screw holes (E).

Make sure that the types of connection on the hoses or tubes to be connected to inlets (J) and outlet (K) are compatible with those of the automatic change-over. Attach these connections and test for gas leakage as per local regulations.

fig. 9



## 8 - Pressure Adjustment (refer to fig. 12)

Low pressure adjustment is available for the qualified gas installer, access can be obtained to the adjustment screw on the regulator under push-on cover (L).

Use the flat end of a 4mm Allen type key fig. 12 and locate the hexagonal socket inside the regulator cover. Adjust clockwise to increase and anti-clockwise to decrease pressure. Do not force the adjuster once reaching the stop in any direction.

Adjustment of regulator can only be performed by competent persons and where subject to local rules and safety restrictions, please refer to them.

## 9 - Start of operation

Turn the hand-wheel of the changeover head (A) fully toward "SERVICE" cylinder – a click stop should normally be felt

Open slowly all cylinders valves ("SERVICE" and "RESERVE") and downstream valves (if any). The indicator should not show red colour anymore.

Check joints with a suitable leak detection fluid and at the hose connections every time the cylinders are changed and the condition of the hose incase there is any damage.

## 10 - Cylinder replacement

The "SERVICE" cylinder is empty when the indicator is red in a stable no-flow or sustained low-flow condition.

It is recommended to re-check this condition after a stabilisation time of a few hours.

To replace an empty cylinder (fig 10):

- Close the empty "SERVICE" cylinder valve

- Rotate the hand wheel (C) half turn to the previous "RESERVE" cylinder, a click stop can normally be felt. Now this becomes "SERVICE" cylinder and the red colour indicator disappears.

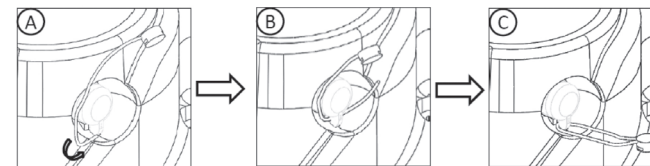
- Replace the empty cylinder with a full one, and tighten the connections

- Open its valve. This cylinder is now the new "RESERVE" cylinder

Always re-check joints with a suitable Leak Detection Fluid.

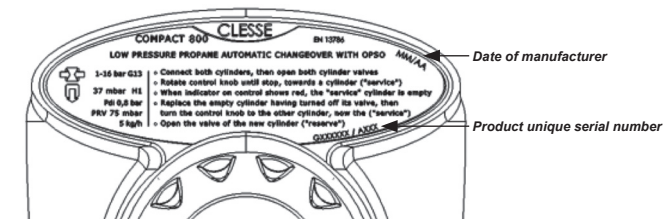
## 11 - Resealing the OPISO Consumer Safety Reset

Normally undertaken by the commissioning engineer - Use the seal and wire supplied in the installation kit. Ensure the reset push button is completely out and that the safety device has been reset. Pass the wire through the sealing hole in the clear push button (A) and pull through assembly (B). Pass the wire trough the seal and squeeze closed (C).



## 12 - Maintenance

The installation shall be inspected regularly, following the rules in force and requirements of local standards. In normal use conditions the automatic change-over will not require maintenance. We recommend replacing it within 10 years of use.



## 13 - Locating the unique product Serial No. and date of manufacture

The product is marked with a unique Serial No. Manufacturing code – please record this below for your service records together date of first commissioning.

DATE OF MANUFACTURE	MM/YY:	/
UNIQUE 11 DIGIT SERIAL No.	G:	
DATE OF FIRST COMMISSIONING	DD/MM/YY:	/ /

## INSTRUCTION SHEET TO BE KEPT BY THE USER

The content of this instruction sheet is presented solely as information, as despite efforts to ensure its correctness, it should not be interpreted as an explicit or implicit cover guarantee for the products or services described or for their use or applicability. We reserve the right to change or improve product design or specifications at any moment and without notice.