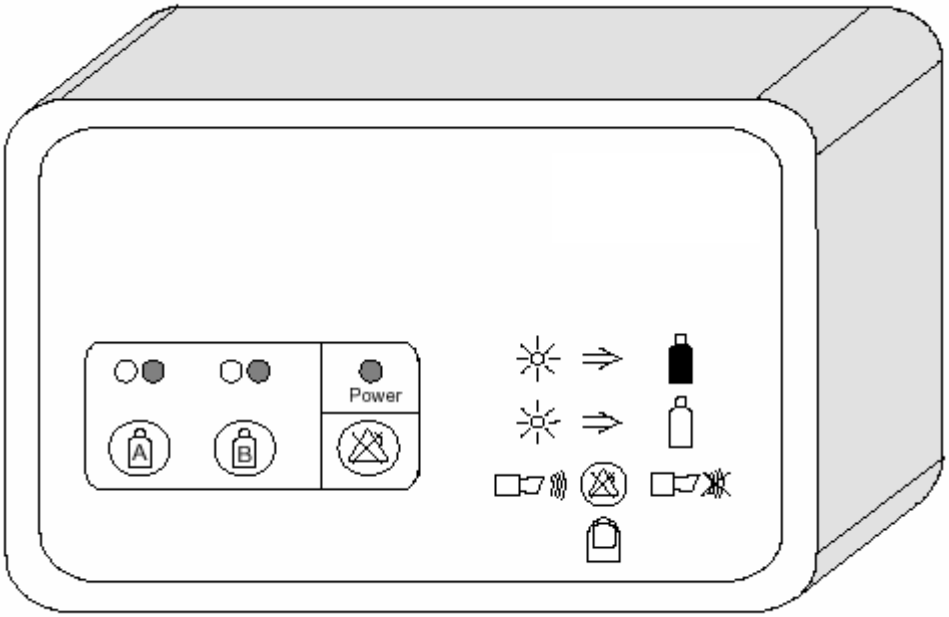
GB

Gas Cylinder Change-Over Unit GM 2

Operating instructions



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WEEE Compliance:

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Thermo Electron has contracted with one or more recycling/disposal companies in each EU Member State, and this product should be disposed of or recycled through them. Further information on Thermo Electron`s compliance with these Directives, the recyclers in your country, and information on Thermo Electron products wich may assist the detection of substances subject to the RoHS Directive are available at **www.thermo.com/WEEERoHS**.

As regards foreign-language translations, the German version of this manual is binding.

Nominal charge

⚠ **This instruction manual information is important for your safety as well as the setup, installation, use and maintenance of the equipment.**

To avoid errors and causing damage, especially personal injury, read this manual carefully before using the equipment and follow all instructions.

1. INSTRUCTIONS FOR SAFE OPERATION

EXPLANATION FOR SAFE OPERATION

	In chapters of the instruction manual which have to do with safety, this icon appears under the title of the chapter. When displayed on the equipment, this icon denotes that special attention must be paid to the instruction manual.
	Indicates information in the instruction manual for using the equipment most effectively.
	Gas cylinder full (cylinder pressure > 0.6 bar)
	Gas cylinder empty (cylinder pressure < 0.6 bar)
	Manual selection, gas cylinder A
	Manual selection, gas cylinder B
	Acoustic alarm ON
	Acoustic alarm OFF
	Fault/alarm acknowledgement
	Yellow indicator lamp: Selected cylinder Red indicator lamp: Cylinder empty

1. INSTRUCTIONS FOR SAFE OPERATION

General

When setting up and operating the unit, make sure that you comply with the instructions contained in this manual as well as all applicable laws, regulations and directives in your country. (FRG: e.g. ZH 1/119, VBG 4, VBG 61, VBG 62)

The unit meets the following safety regulations:

- DIN VDE 0700 Part 1 (IEC 335-1; EN 60335-1/11.90)

If you have any queries or if you are ordering replacement parts, quote the data on the nameplate.

Areas of application

The gas cylinder change-over unit is a laboratory unit designed for **setup and operation** in the following **functions**:

- To change over the gas supply (e.g.: gas supply of a hot-air disinfectable gassed incubator) for laboratories, e.g. as used in commerce, industry, schools, universities, hospitals (safety classes L 1, L 2 and L 3).

Note: This unit is only designed for **non-aggressive and non-flammable gases,** e.g. CO_2, O_2 and N_2 . Maximum input pressure may **not** exceed 2 bar.

Safety instructions

Follow the instruction manual and keep it near the equipment for reference purposes.

Carefully read the instruction manual before starting up the units and follow the instructions contained therein to avoid errors and damage resulting therefrom (especially damage to health).

The unit may only be operated by personnel instructed in its use.

When setting up and operating the unit, make sure that you comply with the instructions contained in this manual as well as all applicable laws, regulations and directives in your country.

Check whether power connection line and connectors are not damaged before using them. If they are damaged, do not connect the unit to the mains.

The voltage specified on the nameplate (measuring voltage) must comply with the rated power voltage.

Work on electrotechnical equipment may only be performed in de-energized state by authorised electrotechnical personnel (voltage off, power plug removed from wall socket).

Only use authorised accessories and original replacement parts. Using other parts will cause unknown risks and should therefore be avoided in all cases.

Safe and reliable operation of the unit can only be guaranteed if the necessary checks, maintenance and repair work are carried out by Thermo Service personnel or by personnel authorised by us.

Thermo Electron LED GmbH shall accept no liability for damage resulting from incorrectly performed repair work which was not carried out by Thermo Service personnel or if components are replaced with non-original replacement parts or accessories. We can assume no liability for improper use.

2. SETUP AND INSTALLATION

Setup

Set up the gas cylinder change-over unit either as a standalone unit or mount it on the wall.

Free standing setup: The attached rubber feet must be stuck on the bottom of the unit.

Wall mounting: The attached fixing flaps must be mounted at the back. The unit should be used as a stencil for drilling, and bored accordingly. Use suitable mounting hardware such as dowels and screws.

Power connection

The unit is equipped with a flexible plug-in power cord. The **plug** disconnects **the unit from the power supply network**. Compare the power voltage and nameplate data (**note the position of voltage selection switch)** and plug in the power cord. At delivery, the unit is set up for **230 V**. If required, it can be switched to **115 V** operation. To change the input voltage, use a suitable tool to alter the setting of the red selector switch on the side of the unit. So that the indicated setting, **230**, changes to **115**.

Gas supply connection

The gas supply connections of the gas cylinder change-over unit are designed for pressure hoses with an inner diameter of 4 mm and a wall thickness of 1 mm. Attach the hose connections between the gas cylinder, GM 2 gas cylinder change-over unit and the consumer as specified in the connection drawing. Cut the supplied hose to appropriate lengths. Connect the supplied hose nozzles to the pressure reducer and secure the connected hoses with ties.

⚠ Only two-stage devices should be employed as cylinder pressure reducers, as these will maintain a constant output supply pressure.

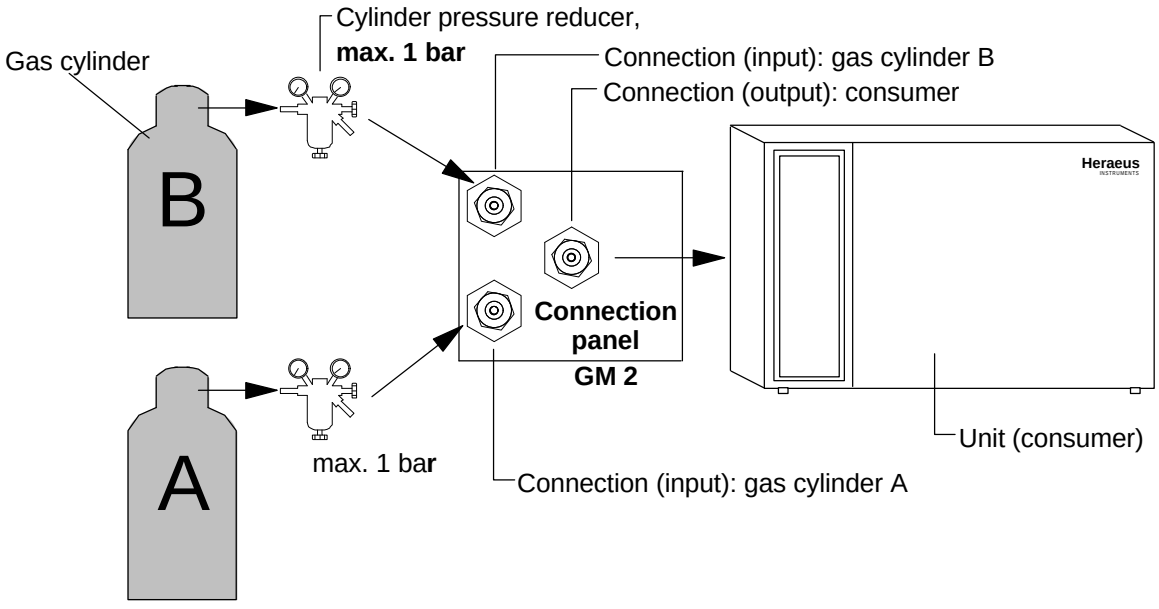

Fig. 1: Gas supply connections

2. SETUP AND INSTALLATION

"Floating contact" connection

The gas cylinder change-over unit is equipped with a floating contact for connection to external control and instrumentation systems. As soon as a fault occurs (cylinder empty), a contact is activated.
Reset the unit when a full cylinder is connected.

The floating contact (1 changeover contact) is rated for the following power circuits:

Circuit	Voltage	Fuse supplied by customer
Power-operated circuits	max. 250 V AC	max. 6 A
SELV / SELV - E circuits (cf. VDE 0100 Part 410)	25/50 V AC 60/120 V DC	max. 2/1 A max. 1/0.5 A

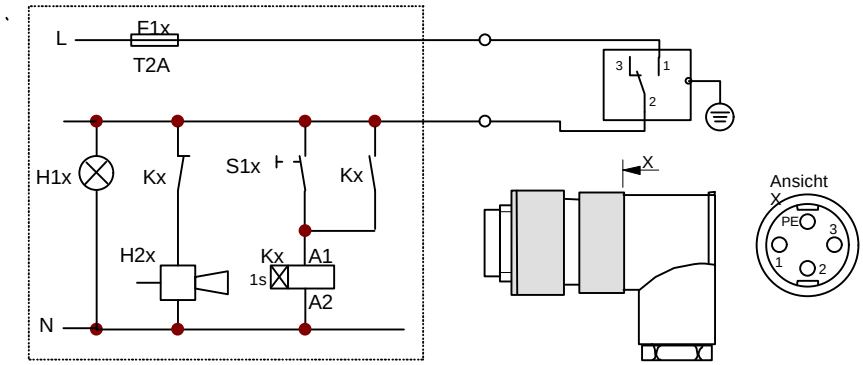

Fig. 2.: Application example of "floating contact" connection

Notice: WARNING EXTERNAL VOLTAGE

3. UNIT DESCRIPTION

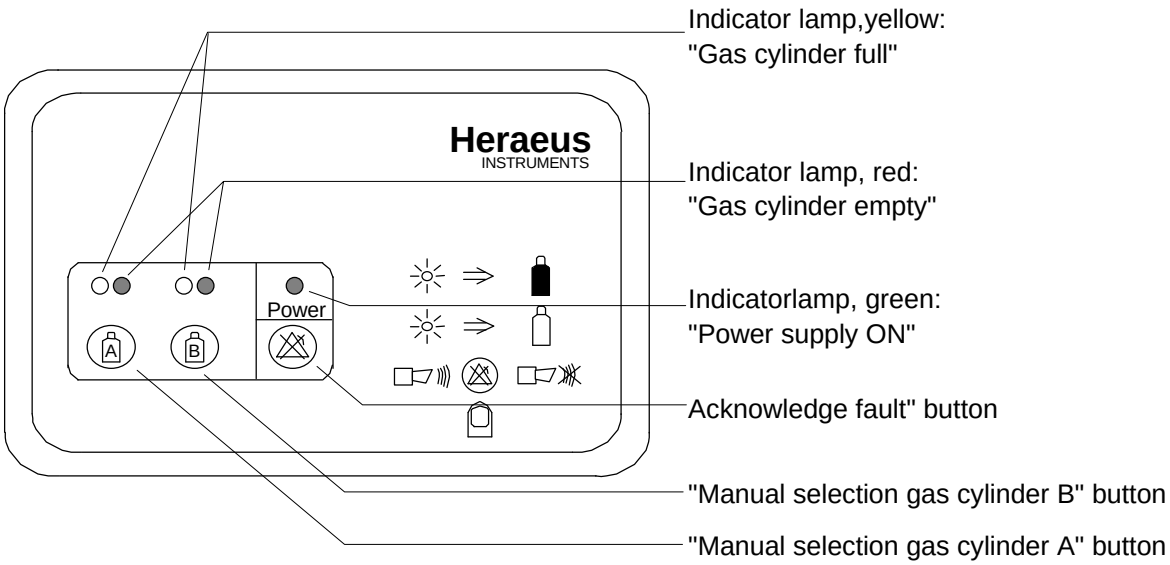

Fig. 3: Operator panel overview

5. SPECIFICATIONS

Operation

Plug in the power cord. The **green** signal lamp indicates that the unit is switched on. Until the input pressure from the connected cylinders, A and B, drops below **0,6 bar**, the **red** signal lamp remains on. The yellow signal lamp indicates the cylinder currently selected.

Open the valve on the gas cylinders and set the pressure regulator on the cylinders for an initial pressure between **0,9 to 1,1 bar**. The **red** signal lamps should go out. Press the **blue** buttons to select the desired cylinder (either A or B), and to switch it to the output. After a cylinder has been manually selected, selection of the remaining cylinder is prevented for approx. 5 seconds. When the connected device (i.e. a gassed incubator) begins draining gas from the selected cylinder, a pressure drop may occur at that cylinder's pressure reducer. For this reason, we recommend adjusting the output pressure at the pressure reducers to **0,9 to 1,1 bar** when gas is being removed. An increase in input pressure once gas has been removed has no negative effect on the operation of the unit as long as the maximum pressure of **2 bar** is not exceeded.

If the pressure in the selected cylinder drops below **0,6 bar** for more than 1 minute, the gas cylinder monitor automatically switches the supply to the second gas cylinder, and the **red** signal lamp of the empty cylinder comes on. Simultaneously, the acoustic alarm is switched on and the alarm output becomes active. Press the "Acknowledge Fault" button to turn the acoustic alarm off. Should the pressure in the empty cylinder again rise above **0,7 bar** after the unit has already switched over to the new cylinder, the unit will not automatically switch back to the previously empty cylinder. However, the empty cylinders **red** signal lamp will go out and its **yellow** signal lamp will begin flashing, so that the empty cylinder can be identified. After the empty cylinder has been replaced, the **red** or flashing **yellow** signal lamps will turn off and the alarm output will no longer be activated.

If, one the alarm has been acknowledged, the empty cylinder is not replaced with a full one, the acoustic alarm is again activated once the second, full cylinder becomes empty. Whenever the pressure in one or both cylinders drops below 0.6 bar for more than 1 minute, the alarm output will be continuously activated.

Possible error messages

1. Green signal lamp flashing

Switching between gas cylinders is performed by a built-in magnetic valve (bi-stable magnetic valve). This prevents a switchover from occurring if there is a power failure. The unit's electronics determines and monitors the position of the magnetic valve. If the unit does **not** detect any response from the magnetic valve after switching over, the procedure is repeated up to 10 times. If the magnetic valve fails to switch over despite repeated attempts to do so, the green signal lamp will flash. A flashing **green** lamp can only be reset by unplugging the unit from the mains power supply.

2. A yellow signal lamp is flashing

Pressure dropped below **0,6 bar** for longer than one minute. However, after switching over to a full cylinder, the pressure climbed above **0,7 bar**. This condition can occur if the pressure at the cylinder ouptut drops below **0,6 bar** as gas is being removed. In this case, adjust the pressure at the pressure reducer so that it lies between **0.9 to 1.1 bar** when gas is drained from the cylinder.

3. Both yellow signal lamps are flashing

This is the same problem as described under 2. above. Here however, the pressure in the second cylinder has also dropped below 0.6 bar for more than one minute after the switchover. In this case, adjust the pressure at both pressure reducers so that it lies between **0,9 to 1,1 bar** when gas is drained from the cylinder.

5. SPECIFICATIONS

	Unit	Value
Mechanical		
Dimensions (W x H x D)	mm	201 x 120 x 95
Weight:	kg	approx. 2.0
Gas data		
Gas types		not suitable for non-aggressive, non-corrosive and non-flammable gases
Purity	%	99,5
Supply pressure	bar	0,9 to 1,1
Approval excessy pressure	bar	max. 2
Electrical		
Rated voltage	V	120 / 230 (switchable)
Rated frequency	Hz	50 / 60
Degree of protection		IP 20
Protection class		I
Rated power consumption	W	5
Fuse supplied by customer		
Fuse		T 16 A
Power contactor		G 16

6. MATERIALS USED

Component	Material
Outer housing	ABS
Controls and display panel	Polyethylene
Other components	Encapsulated electrical components coated with various plastics, some mounted on glass-fibre reinforced PCBs with epoxy resin

Safe and reliable operation of the unit can only be ensured if the following authorised original replacement parts are used.

Using other parts causes unknown risks and must be avoided in all cases.

7. AUTHORISED REPLACEMENT PARTS AND ACCESSORIES

Replacement part	Type	Order No.
Instruction manual		50 047 292
Hose set for gas supply connection		26 139 129
Supply main	230 VAC	50 043 143
Supply main	120 VAC	50 043 145
Plug for "floating contact"		50 034 772
Hose nozzle		26 137 409
Flexible pressure tubing		03 651 009