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Rotarex Group

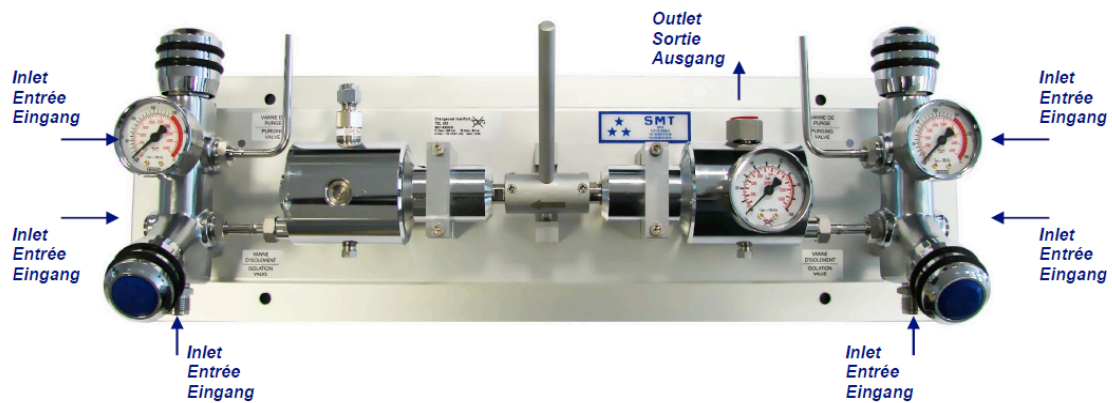
**INSTRUCTION MANUAL**  
**TDL-TDI 202/502**  
**Changeover Manifold**  
切换面板 TDL-TDI 202/502 操作手册

**NT0027GB**

Version:9  
23/09/08  
Page:1


## TDL-TDI 202/502 semi-automatic changeover manifold

### TDL-TDI 202/502 半自动切换面板



SMT,S,rue de Labergement 21110 GENLIS

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Only those persons who have read these technical instruction thoroughly and understand them completely shall be authorized to use the product.

只有完整阅读过这些技术说明书并完全理解其内容的人才能允许使用该产品。

#### **IMPORTANT NOTICE 重要备注**


If this product is being purchased or used for incorporation into another product, then SMT reminds the end product manufacturer that any and all product user warnings, instructions or product labels are the responsibility of the end product manufacturer.

如果此产品被购买或用于与其他产品的配套使用上, SMT 提醒最终产品制造者, 有责任向用户提供所有产品的警告、说明书或产品标签。

<b>C O N T E N T    内 容</b>
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#### **1.DESCRPTION 描 述**

These units are intended for use as regulators/reducers (to10,25 or 50 bars depending on the catalogue data sheet)for pure gases stored at high pressure(200 bars) in cylinders or packs. They enable a gas distribution network to be supplied continuously by automatic

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switching to a reserve source before the source in service has run out.

这些产品是适用于钢瓶内储存的高压(200Bar)高纯气体的调压阀/减压器(压力减到 10Bar, 25Bar, 或 50Bar, 参照目录数据)。在工作气源使用完之前通过自动切换到备用气源, 来实现气体分配系统的持续供气。

The operational of the semi-automatic changeover manifold is based on the use of two pressure regulators connected together by their LP(Low Pressure)outlet. Priority selection is made by means of a lever, which operates the relief screws of the pressure regulators. When the operational gas source runs out, the pressure drop causes the other pressure regulator to open automatically.

半自动切换面板的运行基于两个调压阀在 LP (低压) 出口处相连接。开启使用两气瓶的顺序操作是利用操纵杆来实现, 用操纵杆操作释放调压阀的螺钉, 当一边供气气瓶用完, 压力下降引起另一边调压阀自动打开, 实现自动切换。

The only operator action consists in changing the empty cylinders or packs, after switching the lever to the side which corresponds to the new operational source in order to restore the normal pressure, which explains why the system is called "semi-automatic".

This equipment is designed and approved for a continuous gas supply installation. It is not intended for any other installation or purpose. If the product user has any questions regarding this product's proper application or purpose, the product user should call+33 380 476 100.Any non-approved use or application and/or any non-approved modification If the product or its use or application may result in serious accident or personal injury. SMT is not responsible for any non-approved use or application.

仅有的操作动作是换下空钢瓶, 在换钢瓶之前将操纵杆扳到相应的工作气源的一边, 目的是重建正常压力, 这就是系统称为“半自动”的原因。这套设备适用于连续供气系统的安装, 不适合安装于其他场合。如果用户对产品的适用范围有疑问, 可以致电+33380 476 100。任何未经许可的使用、应用或修改都可能造成事故或人身伤害。SMT 不对任何未经许可的使用或应用负责。

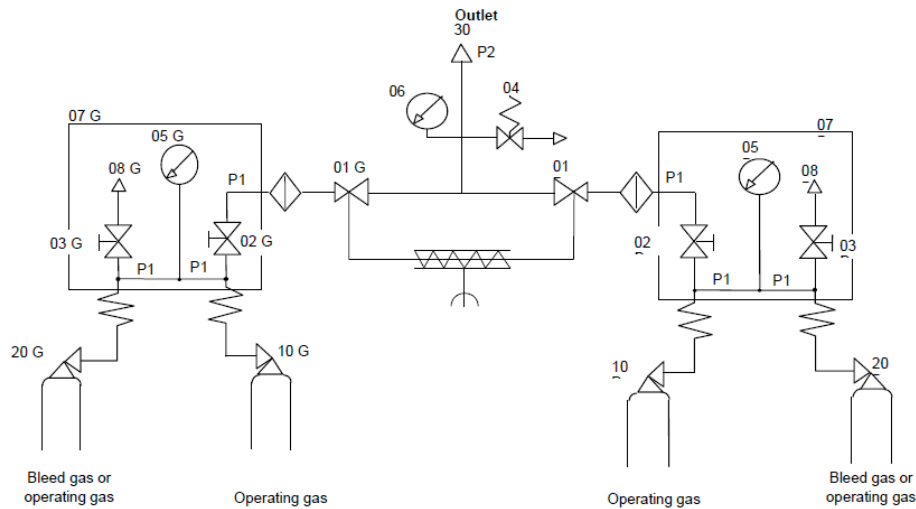


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**Block diagram 系统示意图**

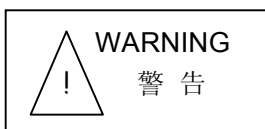


ITEM	DESIGNATION
D	RH side
G	LH side
01	Pressure regulator
02	Duobloc utilization valve
03	Duobloc bleed valve
04	Safety valve
05	Duobloc H.P. pressure gauge
06	Change-over L.P. pressure
07	Duobloc
08	Bleed adapter
10	Utilization gas supply P <sub>1</sub>
20	Bleed gas supply
30	Utilisation gas outlet P <sub>2</sub>

**2.GENERAL SAFETY REQUIREMENTS 一般安全要求**


All users must comply fully with all national or local laws, rules or regulations in force. Anyone using this product must be thoroughly familiar with these instructions and other applicable product instructions and manuals.

所有用户必须遵守所有国际和国内法律、规定或要求的规章。任何人在使用产品时必须完全熟悉产品说明书和操作手册。



This is a component part designed for use in a pure gas continuous supply installation. The final manufacturer is responsible for preparing appropriate and adequate instructions and warnings for the ultimate product user.

该部件是设计用于高纯气体的持续供应装置。最终生产商有责任向最终用户提供适当及

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充足的产品说明和警告。

The maintenance instructions outlined below shall be incorporated into any product Manual or instruction label.


以下概括的维护说明应与产品手册和说明标签结合使用。

Failure to follow any instruction or warning within this instruction manual or on any product label may result in a serious accident involving alter personal injury, property damage or both.

不遵守手册或产品说明标签里的指示或警告可能会造成严重事故，甚至人身伤害和财产损失。

#### **General rules: 一般规定**

- Use only equipment which is compatible with the type of gas used and the required pressures and flow-rates.  
应用于与气体类型，需求的压力和流速相匹配的设备。
- Use only equipment which is in perfect condition.  
在正确条件下使用设备。
- Never carry out work on a changeover manifold or pipe under pressure.  
不要在切换面板或管道承压时工作。
- Provide safety devices for the prevention of risks connected with overpressures backflows of products.  
提供安全装置，防止过压逆流。
- SLOWLY and PROGRESSIVELY open the valves of cylinders or bundles, and all other valves.  
缓慢逐渐地打开瓶阀和其他阀门。
- Maintain the sealing of the systems.  
保持系统密封。
- Do not lubricate equipment and accessories.  
不要润滑设备和附件。
- Never smoke in the vicinity (risk of explosion).  
不要在附近吸烟（有爆炸危险）。
- Never heat, or bring a flame near the equipment (risk of explosion and damage).  
设备周围禁止加热和火焰（有爆炸和伤害危险）。
- Never power the changeover manifold from the outlet (risk of contamination and damage).  
切换面板的出口禁止施压（可能污染气体和造成伤害）。
- In the case of hydrogen, it is necessary to route bleeds to a sufficient height. Avoid ejecting bleed gases at a height of less than 2.5 above floor level(the flame of burning hydrogen is difficult to see, and this precaution will prevent burns to the human body).  
如果用于氢气，吹扫线路应该达到充分的高度。吹扫出去的气体高度应高于地

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面 2.5m（因为氢气的燃烧火焰难以看见，这项措施是为了预防烧伤人体）。

- If the bleed outlets and the valve outlet are grouped together on the same manifold, do not install the valve at the outlet of this bleed network.  
如果吹扫出口和阀门出口组装在同一块面板上，不要把阀门安装在吹扫管路的出口上。
- Keep this equipment perfectly clean. The ingress of particles during the various handling operations is the cause of most failures.  
保持设备十分清洁。各个操作工序都可能带入杂质导致设备失败。
- To guarantee safe operation, a gas module must be installed and maintained by an SMT specialist or a specialist approved by SMT.  
为了保证安全操作，气体模块必须由 SMT 专家或经 SMT 认可的专家来进行安装和维护。
- It is advisable to name a gas and equipment supervisor, on the operating site, “who will ensure that all safety rules are complied with”.  
建议在操作现场指定一个气体和设备监督人，专门负责安全规章的执行。

### 3. OPERATIONAL SPECIFICATIONS 操作说明

Reminder:  $1\text{Nm}^3/\text{h} = 1\text{m}_3/\text{h}$  at  $0^\circ$  and 1.013 bars.


Usable gases 适用气体	TDL	Argon (Ar), Nitrogen (N <sub>2</sub> ), Helium (He), Hydrogen (H <sub>2</sub> ), Carbon dioxide (CO <sub>2</sub> )
	TDI	Argon (Ar), Nitrogen (N <sub>2</sub> ), Helium (He), Hydrogen (H <sub>2</sub> ), Carbon dioxide (CO <sub>2</sub> ) And corrosive gases: please call us
Max, service pressure P1 最大工作压力		200 bars
Downstream pressure P2 出口压力		Factory preset to 10/25/50 bars 出厂预设压力
Nominal flow-rate 流量		10/50 Nm <sup>3</sup> /h
$\Delta P$ on automatic switch-over 自动切换压差		20% of P <sub>2</sub>
Operating temperature 工作温度		-20°C to +50 °C.

### 4. INSTALLATION INSTRUCTIONS AND HANDLING 安装说明和操作

#### A. Assembly of the unit 装配部件

- a) Anchor the unit by means of its mounting holes.  
通过装配孔固定部件。

<b>NOTE:</b> 注意	<b>The surface on which the changeover manifold is to be installed shall be flat. Any noticeable distortion of the Chassis, during assembly, can prevent the unit from Operating correctly.</b> 切换面板的安装面应该是平坦的。装配过程中，底盘上的任
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	何明显扭曲都可能造成操作失败。
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- b) Connect the outlet of the changeover manifold to the user application.  
将切换面板的出口连接用户的设备上。
- c) Connect the supplies to the inlets of the changeover manifold.  
将气源连接到切换面板的入口。
- d) Install a bleed manifold (particularly in the case of flammable gases).  
安装释放系统（特别对于易燃性气体）

#### **B. General sealing check 一般密封测试**

- **Check that bleed valves(03G and 03D) and shut off valves(02G and 02G) are closed.**  
检查泄压阀（03G 和 03D）及截止阀（02G 和 02G）确保关闭。
- Set the lever to the “up” or “down” position, depending on the source to be used first (the arrow shows the gas source which will be in service).  
设置操纵杆到“up”或“down”的位置，此选项取决于首先被使用的气源（箭头指向供气端）。
- Slowly open all cylinder valves (20G, 10G, 10D, 20D), and then close them. The pressure in the cylinders is read on the two high pressure gauges (05G and 05D).  
缓慢打开所有钢瓶阀门(20G, 10G, 10D, 20D)，然后关闭它们。钢瓶压力在两个高压表（05G and 05D）上可读。
- Check that the values indicated on the high pressure gauges do not vary, over a period of approximately one minute.  
确保高压表所显示的数值不变，维持时间大约超过一分钟。
- If there is a variation, this means that there is a leak. Find the leak using a leak detector. Once the leak has been located, open the bleed valves (03G and 03D), disassemble and check the connector, then retighten it.  
如果数值有变化，说明有泄漏。用泄漏探测器找到泄漏处。一旦找到泄漏处，打开泄压阀，拆下并检查连接器，然后重新紧固。


<b>CAUTION:</b> 警告	<b>Never retighten a connector while is under gas Pressure. Always open valves and cocks SLOWLY.</b> 禁止在承压时紧固连接器。始终缓慢开启阀门和龙头。
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#### **C. Bleeding the unit and the installation 吹扫和安装部件**

- Check that valves (02G and 02D) and bleed valves (03G and 03D), are closed.  
检查阀门（02G 和 02D）及泄压阀（03G 和 03D）确保关闭。
- In the case where the outlet pressure regulator option is used, check that the relief screw is unscrewed.

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如果出口减压阀被选用时，检查泄压螺钉，应处于未拧紧状态。

### **1<sup>st</sup> phase: Bleeding of hoses 第一阶段：泄压软管**

#### **a) Bleeding of the right-hand side: 右边泻压**

- Successively bleed all hoses by carrying out at least three compression-relief cycles, i.e.  
连续执行至少三次压缩和释放循环，实现所有的软管泻压。
- Open the cylinder valves.  
打开钢瓶阀门。
- The pressure is indicated on HP pressure gauge (05D).  
压力显示在 HP 压力表(05D)上。
- Close the cylinder valve.  
关闭钢瓶阀门。
- Open bleed valve (03D).  
打开泄压阀(03D)。
- Close the bleed valve when H.P. pressure gauge (05D) gives a reading of 0.  
当 HP 压力表(05D)显示值为 0 时，关闭泄压阀。
- Repeat this operation at least twice.  
重复以上操作至少两次。

#### **b) Bleeding of the left-hand side: 左边泄压**


- Same operation as in a), using the valves which correspond to the left-hand side.  
操作同 a)，用与左边相对应的阀门。

### **2<sup>nd</sup> phase: Operational check 第二阶段：操作检查**

#### **Initial state:初始状态：**

- cylinder valves closed.钢瓶阀门关闭
- inlet valves closed.入口阀门关闭
- bleed valves closed.泄压阀门关闭
- Open the cylinder valves of each of the sources.  
打开每个气源的钢瓶阀门。
- Slowly open inlet valve (02G) or (02D) (whichever side is chosen as the source).  
缓慢打开入口阀门(02G) 或 (02D)（作为气源的一端）。
- Make a note of the operating pressure indicated on LP pressure gauge (06).  
记录下显示在 LP 压力表(06)的操作压力。
- Slowly open inlet valve (02G) or (02D) (whichever side is chosen as the reserve).  
缓慢打开入口阀门(02G) 或 (02D)（作为备用气源的一端）。
- Allow gas to flow through the changeover manifold, and bleed all the pipes.  
允许气体流经切换面板，置换所有的管道。
- If an outlet pressure regulator is used, do not to get to screw in the relief screw.  
如果使用了出口减压阀，不要拧紧释放螺钉。



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### **3<sup>rd</sup> phase: Automatic switch-over check 第三阶段：自动切换检查**

- Close the cylinder valve of the source in service; the indication decreases on the high pressure gauge of the source in service.  
关闭供气端的钢瓶阀门，供气端的高压表显示值将减小。
- When this pressure has dropped to approximately  $P_2-20\%$ , the reserve source should come into service.  
当压力减少到大约  $P_2-20\%$  时，备用气源将投入使用。
- Change the position of the lever, the initial pressure of  $P_2$  is restored.  
改变操纵杆的位置，重新建立  $P_2$  的初始压力。
- This operation can be repeated in reverse order; this will check the automatic operational switch-over in both directions.  
此操作可以在相反方向重复，用以检查两个方向的自动切换操作。
- The changeover manifold has now been tested and is ready to operate.  
至此切换面板测试完毕可投入运行。
- Open the operating valve. Gas flows from the changeover manifold at the required pressure, and the source in service is the one defined by the position of the lever.  
打开操作阀门。气体按照所需压力从切换面板流出，工作气源由操纵杆的位置决定。
- When the source in service becomes depleted, the changeover manifold will automatically switch to the reserve source. When replacing the depleted cylinders, it will simply be necessary to change the position of the lever so that the source which was originally in reserve is put into service and that the full cylinders are used as the reserve source.  
当工作气源将用尽时，切换面板会自动切换到备用气源。更换空钢瓶时，需要改变操纵杆的位置，这样最初作为备用气源的气体投入使用，更换上的满钢瓶被作为备用气源。

### **Cylinder replacement procedure 钢瓶更换程序**

#### **Left-hand cylinder(s) to be replaced**

##### **左边钢瓶的更换**

1. Set the lever to its "down" position  
将操纵杆置于"down"位置
2. Close valve (02G)  
关闭阀门(02G)
3. Close the cylinder valve(s)  
关闭钢瓶阀门
- 4 .Slowly open valve(03G)  
缓慢打开阀门(03G)
5. Close valve (03G)  
关闭阀门(03G)

#### **Right-hand cylinder(s) to be replaced**

##### **右边钢瓶的更换**

16. Set the lever to its "up" position  
将操纵杆置于"up"位置
17. Close valve (02D)  
关闭阀门(02D)
18. Close the cylinder valve (s)  
关闭钢瓶阀门
19. Slowly open valve (03D)  
缓慢打开阀门(03D)
20. Close valve (03D)  
关闭阀门(03D)



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6. Unscrew the cylinder hose

旋开钢瓶软管

7. Replace the cylinder(s)

替换钢瓶

8. Screw the hose back on, after  
replacing the seal

替换密封垫之后，将软管后端旋上

9. Slowly open the cylinder valve(s)

缓慢打开钢瓶阀门

10. Close the cylinder valve(s)

关闭钢瓶阀门

11. Wait 1 minute

等待一分钟

12. Slowly open valve (03G)

缓慢打开阀门(03G)

13. Close valve (03G)

关闭阀门(03G)

14. Repeat Cycle (9) to (13) twice

重复循环操作(9)到(13)的操作两次

15. Slowly open valve (02G)

缓慢打开阀门(02G)

21. Unscrew the cylinder hose

旋开钢瓶软管

22. Replace the cylinder(s)

替换钢瓶

23. Screw the hose back on, after  
replacing the seal

替换密封垫之后，将软管后端旋上

24. Slowly open the cylinder valve(s)

缓慢打开钢瓶阀门

25. Close the cylinder valve(s)

关闭钢瓶阀门

26. Wait 1 minute

等待一分钟

27. Slowly open valve (03D)

缓慢打开阀门(03D)

28. Close valve (03D)

关闭阀门(03D)

29. Repeat cycle (24) to (28) twice

重复循环操作(24)到(28)两次

30. Slowly open valve (02D)

缓慢打开阀门(02D)

**5. MAINTENANCE 维护**


This warranty does not cover the following: 此担保不包括以下内容:

- Repair or replacement due to normal wear or damage during routine maintenance.  
由于常规维护中的正常磨损或损害而进行的修理和替换。
- Damage to components whose fragility is determined by product design.  
由产品设计所决定的易损部件的损坏。
- Damage from not following recommended maintenance and procedures, as outlined in this instruction manual.  
由于未遵照下列手册中所述的维护程序所造成的损坏。
- Damage arising from modifications not included in the procedures in this instruction manual.  
进行手册中未含程序的修改所造成的损失。
- Damage resulting from the use of unauthorized parts, supplied, manufactured or modified by procedures not included in this instruction manual.  
使用未经授权，手册中未包含的供应，制造，修改部件所造成的损害。

Maintenance, repairs and/or reconditioning of these changeover manifolds are the responsibility of the user or the operator. Anyone attempting to maintain, repair or recondition this product must be thoroughly familiar with COMPRESSED GAS ASSOCIATION Standard V-9 and E-4, and all other standards and regulations referred to

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SMT reserves the possibility at any time to change technical contents without previous consent.

 <p><b>SMT</b> Rotarex Group</p>	<p><b>INSTRUCTION MANUAL</b> <b>TDL-TDI 202/502</b> <b>Changeover Manifold</b> <b>切换面板 TDL-TDI 202/502 操作手册</b></p>	<p><b>NT0027GB</b> <b>Version:9</b> <b>23/09/08</b> <b>Page:11</b></p>
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therein.

对切换面板的维护，修理或重新调整是使用者或操作者的责任。任何想要维护、修理或重新调整产品的人必须完全熟悉压缩气体联合标准 V-9 和 E-4，和所有与之相关联的其他标准和规章。

According to CGA v-9, maintenance, repairs and/or reconditioning shall only be performed by properly trained personnel.

根据 CGA v-9，只有经过适当训练的人员才能进行维护、修理和重新调整。

In the case of an incident or a complaint, the user must send us the products assumed to be defective, packaged appropriately . Unless otherwise agreed by us, the user shall not attempt any operation on the equipment(disassembly, repair, modification, etc), otherwise our warranty will be void.

遇到事故或投诉的情况，用户必须将认为有缺陷的产品适当包装寄给我们。除非得到我们的同意，用户不可以尝试对设备进行任何操作（拆卸，修理，修改，等等），否则我们不承担任何担保与责任。

#### WARNING 注意



Failure to follow the installation instructions and handling instructions may result in accident or personal injury, for which SMT declines any responsibility.

不按照安装说明和操作说明可能造成的事故或人身伤害，SMT 不对此负责。