

denaline s.p.a.	INSTRUCTIONS FOR USE	ID-04-005
Instructions for use of Pressure Accessories according to Article 4.3 of the Directive 2014/68/EU (PED) that use refrigerant fluids belonging to group 2 (PED)		Date 19/05/2023 Vers. N° 18
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These instructions of use are referred to pressure accessories (after named valves) manufactured by Dena Line S.p.A. using refrigerant fluids complying with group 2 (PED).

Table A : Technical Information

Type Valves	□20	□22	□30	□35	□45
Nominal Size	DN10	DN15	DN20	DN25	DN32
Standard Valves for refrigerant fluids of the Group 2 PED	Maximum allowable pressure (PS)			50 bar	
	Min./Max. allowable temperature (TS)			-40 / +180 °C *	
Special Valves for R744 (CO₂)	Maximum allowable pressure (PS)			160 bar	
	Min./Max. allowable temperature (TS)			-40 / +200 °C	

*In the presence of Schrader valve core, the maximum allowable temperature is 130 °C.

Figure 1 – Example of valves:

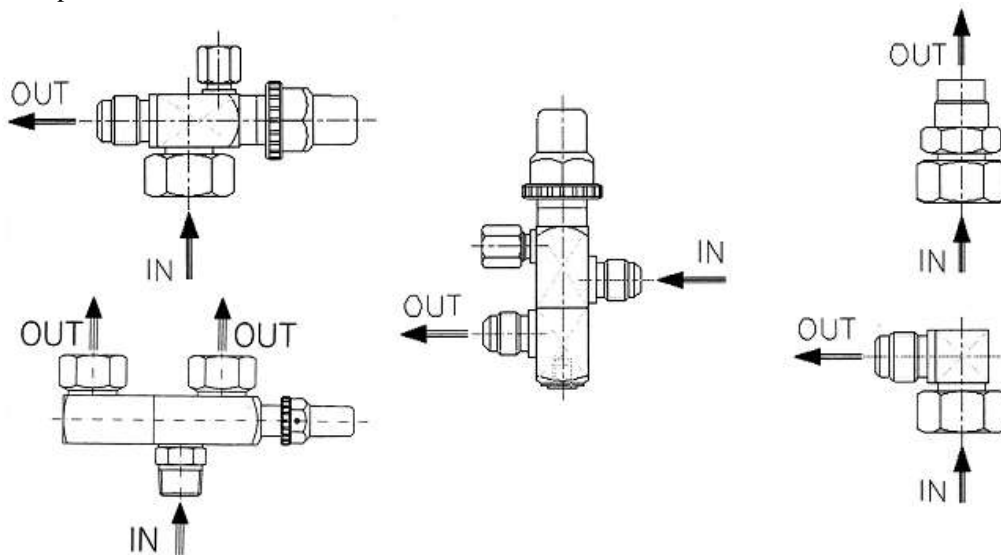
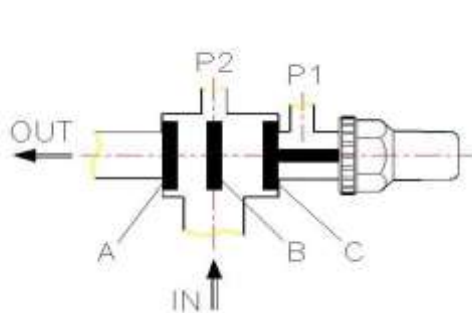


Figure 2 – Schematic operation of the valves (three-way valves excluded):



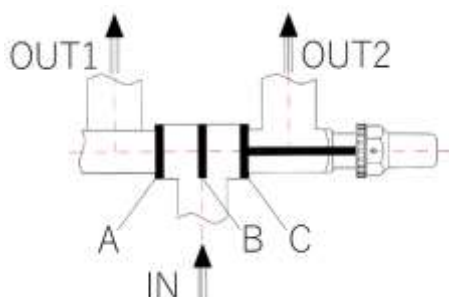
SPINDLE POSITION	FUNCTION
A	OUT CLOSED
B	COMPLETELY OPEN
C	P1 CLOSED

Please notice: - P1-P2 : optional gauge ports.
- The positions IN – OUT can be inverted according to Customers' use.
- The welded connections of the valve to the unit must be done with the spindle set in position B.

18	19/05/23	Updated Max. allowable temperature 180°C, it was 150°C	M. Tonicic	A. Avanzini
17	10/06/22	Updated closing torques for spindles	M. Tonicic	A. Avanzini
16	02/11/21	Requirements according to EN 378-1 and EN 378-2 added	M. Tonicic	A. Avanzini
15	04/08/21	Updated closing torques for gauge port caps	M. Tonicic	A. Avanzini
14	26/02/21	Updated closing torques for thread connections	M. Tonicic	A. Avanzini
Vers.	Date	Description	Prepared	Approved

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Figure 3 – Schematic operation of the three-way valve:



SPINDLE POSITION	FUNCTION
A	OUT1 CLOSED
B	COMPLETELY OPEN
C	OUT2 CLOSED

Please notice:

- The positions IN – OUT can not be inverted.
- The soldered connection of the valve to the unit must be done with the spindle set in position B.

- ❑ The valves are used for the refrigeration and air conditioning, in the sectors where the principles of the refrigerating cycle and heat exchange between refrigerant fluids are applied.
- ❑ Refrigerant fluids included in the Group 2 on the Directive 2014/68/EU can be used.
- ❑ The Customer must comply with the environmental and safety requirements, according to EN 378-1 and EN 378-2.
- ❑ The valves must be assembled to the units that are equipped with devices for the protection against the overcoming of the permissible limits indicated in the Table A.
- ❑ The valves are provided with adequate connections for fixing them at the liquid receiver or at the unit (free of refrigerant fluid). Check that the spindle is in position B (Figure 2) before fixing the valves. The valves with ODS connections must be fixed to the unit (free of refrigerant fluid) through their own tube inserted inside the ODS connections by braze welding with silver or brass alloy or through TIG welding. **During the welding it's useful to protect the body of the valves with a wet cloth.**

For threaded connections, the following closing torques are suggested:

- | | |
|--------------------------------------|----------------------------------|
| - 3/4" –16 UNF rotalock: 30÷40 Nm | - 5/8" SAE connections: 60÷65 Nm |
| - 1" –14 UNS rotalock: 50÷60 Nm | - 3/4" SAE connections: 80÷90 Nm |
| - 1 1/4" –12 UNF rotalock: 80÷90 Nm | - 1/8" NPT connections: 10÷12 Nm |
| - 1 1/2" –16 UN rotalock: 90÷100 Nm | - 1/4" NPT connections: 20÷22 Nm |
| - 1 3/4" –12 UN rotalock: 110÷120 Nm | - 3/8" NPT connections: 40÷45 Nm |
| - 2 1/4" –12 UN rotalock: 130÷140 Nm | - 1/2" NPT connections: 60÷65 Nm |
| - 1/4" SAE connections: 12÷16 Nm | - 3/4" NPT connections: 90÷95 Nm |
| - 3/8" SAE connections: 30÷35 Nm | |
| - 1/2" SAE connections: 45÷50 Nm | |

The connection to threaded SAE fittings shall be made by means of the double ended wrench using copper gasket. The connection to the rotalock connections shall be done using the specific gaskets in PTFE material. For NPT connections, sealants can be used.

- ❑ We suggest to use the following closing torque expressed in [Nm], see the Figure 4 and the Table B

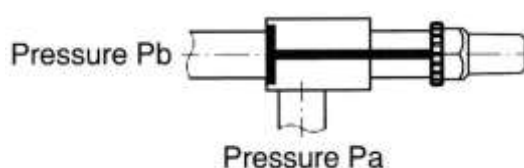


Figure 4 – Closing of the spindle

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Table B: Closing torques

VALVE TYPE	SPINDLE CLOSING WITH $P_a \geq P_b$	SPINDLE CLOSING WITH $P_b > P_a$	SPINDLE RETROCLOSING	RING NUT CLOSING	PLASTIC CAPS CLOSING	CAPS FOR GAUGE PORTS CLOSING
□20	10÷12 max 25	12÷15 max 25	8÷10	5÷8	8	12÷18
□22	10÷12 max 25	12÷15 max 25	10÷12			
□30	12÷17 max 40	30÷35* max 40	12÷15			
□35	32÷35 max 60	55÷60* max 65	25÷28	12÷14	16	
□45	32÷35 max 60	60÷65* max 70	22÷25			

Attention: After repeated openings-closings of the spindle, it is recommended to verify the closing of the ring nut.
* Before moving the spindle, it is strongly recommended to loosen the ring nut by half a turn. Once the movement of the spindle has been completed, tighten the ring nut to the recommended torque.

If problems arise with the spindle sealing by applying the closing torque ranges as per table B, we recommend that you follow the procedure below:

1. Relieve the pressure in the valve
2. Loosen the ring nut half a turn
3. Unscrew the spindle a couple of turns
4. Re-tighten the spindle, never exceeding the maximum closing torque
5. Re-tighten the ring nut to the recommended torque.

- It is important not to use the valves with working parameters other than those indicated in Table A. Different uses must be authorized by Dena Line S.p.A.
- During the operating phase, the Customer must carry out an external inspection every six months, verifying possible leakage of refrigerant (more than 6 grams per year) and/or presence of oxidation. The Customer might at his discretion increase the number of external inspections.
- The conformation of the valves is such that inner inspection can not be made.
- Valves used correctly do not require any maintenance.
- Valves (three-way valves excluded) shall be used for unloading or for loading fluid in the system, only through the gauge port P1 (Figure 2). Procedure :
 - 1- Move the spindle in position C (Figure 2) following the closing torque in Table B.
 - 2- Take off the gauge port cap P1.
 - 3- Connect the unloading or loading device to the gauge port P1.
 - 4- Move the spindle to position B.
 - 5- Unload or load the refrigerant fluid.
 - 6- Before disconnecting the unloading or loading device, the spindle must be moved to position C.
 - 7- Screw the gauge port cap at the recommended closing torque indicated in Table B.
 - 8- Move the spindle to the position of use.

Warning: During the phase of unloading or loading, it is the Customer's responsibility to foresee one or more security devices to take care of the risk of uncontrolled spillage of the pressurized fluid or of excessive filling or pressurization and the instability of the valve.
- Modifications to the valves, and welds that are not intended to connect them to the system through the appropriate ODS connections are not allowed.
- In order to prevent breaking of the walls and of the weldings of the valves connections, do not stress their connections by loadings and / or moments.
- The Customer shall protect the valves from the risk of fire from outside.
- Impacts to the valves from outside are not allowed.
- The Customer must inform Dena Line S.p.A. of eventual risks due to traffic, earthquake and wear, otherwise it will take charge of them.

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- ❑ Place the valves away from atmospheric agents, otherwise the Customer should put in place suitable protection.
- ❑ Dena Line S.p.A. guarantees the following resistances to corrosion in salt spray (according to ASTM-B117):
 - Copper plated valves : 10 hours
 - Nickel plated valves : 20 hours
 - Standard tin-plated valves : 250 hours
 - Special tin-plated valves : 300 or 500 hours
- ❑ The valves are not verified from the point of view of dynamic stresses, therefore the Customer must request for such verifications to Dena Line S.p.A. where necessary. Vibrations of the valves above 1mm/s² or cyclic variations of the pressure more than 8-10 bar and cyclic variations of the temperature more than 20°C are not recommended, since they would reduce the service life of the valves.
- ❑ It is Customer responsibility to respect the regulations and / or laws of the State where the valves are installed by providing the eventual documentation and / or certification and / or making additional examinations.
- ❑ Further information and / or technical details shall be requested to Dena Line S.p.A.
- ❑ Dena Line S.p.A. does not assume any responsibility for any different use from what indicated above.