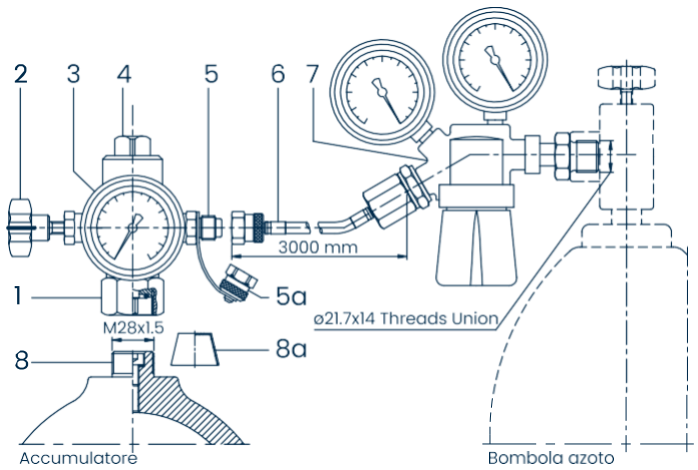
ANNEX I

S.IP
energy flow

Instructions, for pre-charging hydropneumatic accumulators

Instructions to pre-charge and check hydropneumatic accumulators with device type DP100 (for gas valve M28x1.5) up to 350 bar MAX

1. Fastening ring nut
2. Relief valve
3. Gauge
4. Valve opening handwheel
5. Pre-charge fitting
6. Hose (MAX 600 bar)
7. Pressure reducer
8. Pre-charge valve



Notes:

- To pre-charge use nitrogen only; use of other gases could generate danger of explosion of the accumulator body.
- The pre-charge pressure permitted depends on the gauge assembled on the equipment. MAX 350 bar.
- The pre-charge pressure must be a maximum of 9/10 of the minimum working pressure and, at least 1/4 of the maximum working pressure.
- If the assembly works at a high temperature, very different from the ambient temperature, calculate the pressure of pre-charging with the formula in the use and maintenance manual.
- Check the pre-charge pressure after two or three months and, then, every 6 months.

Pressure control or reduction

For this operation, the hose (6) and the pressure reducer (7) are not necessary.

Discharge the pressure in the hydraulic circuit.

Remove the safety cap (8a) of the threading M28x1.5 (8) on the accumulator/dampener.

Assemble the pre-charge device by screwing in the hex ring nut (1), ensuring the relief valve (2) is closed.

Unscrew the panel (4) and read the charge pressure on the gauge (3); if it is too high, open the relief valve (2) slightly.

Screw on the panel (4) and discharge the residual pressure on the pre-charge equipment using the relief valve (2).

Remove the pre-charge device and place the safety cap (8a) back on the threading (8) of the accumulator.

Increasing pre-charge pressure

To pre-charge or increase the pre-charge pressure of the accumulators, remove the safety cap (8a) of the threading (8) on the accumulator/dampener.

Assemble the pre-charge device by screwing in the hex ring nut (1), ensuring the relief valve (2) is closed.

Remove the cap (5a) and connect the hose (6) to the fitting (5) and to the pressure reducer (7) assembled on the nitrogen cylinder.

Unscrew the panel (4) and slowly open the nitrogen cylinder tap. Checking the gauge (3), increase the pre-charge pressure, using the adjustment knob on the pressure reducer (7), to a value slightly higher than desired.

Screw in the panel (4), close the cylinder tap and empty the hose (6) opening the valve (2).

Remove the hose (6), put the cap (5a) back on the fitting (5) and wait a few minutes.

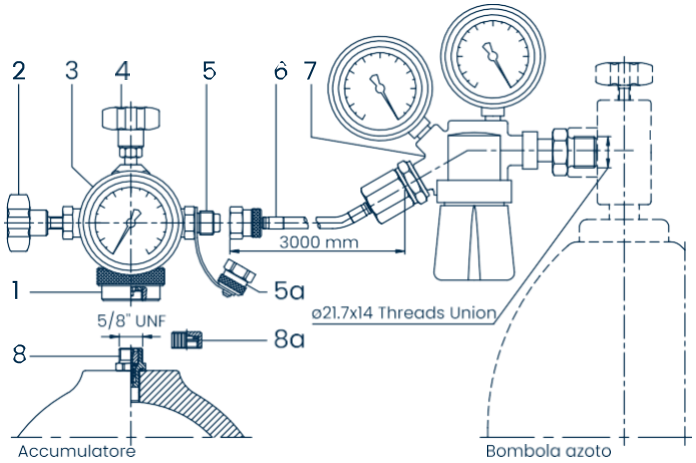
Unscrew the panel (4) and check the pressure; if correct, screw the panel (4), remove the device by unscrewing the hex ring nut (1) and put the safety cap (8a) back on the threading (8); if not exact, increase or reduce the pressure as indicated above.

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Instructions to pre-charge and check hydropneumatic accumulators with device type DP200 (for gas valve 5/8” UNF) up to 350 bar MAX

1. Fastening ring nut
2. Relief valve
3. Gauge
4. Valve opening handwheel
5. Pre-charge fitting
6. Hose (MAX 600 bar)
7. Pressure reducer
8. Pre-charge valve



Notes:

- To pre-charge use nitrogen only; use of other gases could generate danger of explosion of the accumulator/dampener body.
- The pre-charge pressure permitted depends on the gauge assembled on the equipment. MAX 350 bar.
- The pre-charge pressure must be a maximum of 9/10 of the minimum working pressure and, at least 1/4 of the maximum working pressure.
- If the assembly works at a high temperature, very different from the ambient temperature, calculate the pre-charge pressure with the formula in the use and maintenance manual.
- Check the pre-charge pressure after two or three months and, then, every 6 months.

Pressure control or reduction

For this operation, the hose (6) and the pressure reducer (7) are not necessary.

Discharge the pressure in the hydraulic circuit.

Remove the safety cap (8a) on the pre-charge valve 5/8" UNF (8) on the accumulator / dampener.

Assemble the pre-charge device by screwing in the ring nut (1) on the accumulator valve (8), ensuring the relief valve (2) is closed.

Screw in without tightening the handwheel (4) and read the charge pressure on the gauge (3); if it is too high, open the relief valve (2) slightly.

Unscrew the handwheel (4) and discharge the residual pressure on the pre-charge device using the relief valve (2).

Remove the pre-charge device and place the safety cap (8a) back on the valve (8) of the accumulator.

Increasing pre-charge pressure

To pre-charge or increase the pre-charge pressure of the accumulators, remove the safety cap (8a) of the valve (8) on the accumulator/dampener.

Assemble the pre-charge device by screwing in the ring nut (1) on the accumulator valve (8), ensuring the relief valve (2) is closed.

Remove the cap (5a) and connect the hose (6) to the fitting (5) and to the pressure reducer (7) assembled on the nitrogen cylinder.

Screw in, without forcing, the handwheel (4) and slowly open the nitrogen cylinder tap.

Checking the gauge (3), increase the pre-charge pressure, using the adjustment knob on the pressure reducer (7), to the value slightly over that desired.

Unscrew the handwheel (4), close the cylinder tap and empty the hose (6) opening the valve (2).

Remove the hose (6), put the cap (5a) back on the fitting (5) and wait a few minutes.

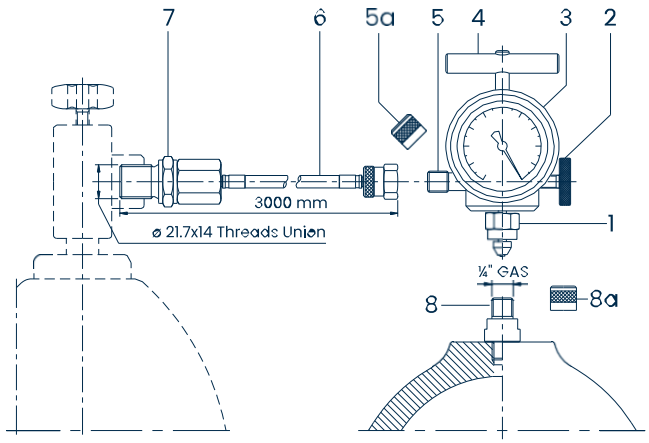
Screw in the handwheel (4) and check the pressure: if it is correct, unscrew the handwheel (4), remove the device by unscrewing the ring nut (1) and put the safety cap (8a) back on the valve (8); if not exact, increase or reduce the pressure as indicated above.

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Instructions to pre-charge and check the hydropneumatic accumulators with device type DP300 (for gas valve 1/4” BSP) up to 690 bar MAX

1. Fixing nut
2. Relief valve
3. Gauge
4. Valve opening handwheel
5. Pre-charge fitting
6. Hose (MAX 600 bar)
7. Pressure reducer
8. Pre-charge valve



Notes:
- To pre-charge use nitrogen only; use of other gases could generate danger of explosion of the accumulator/dampener body.
- The pre-charge pressure permitted depends on the gauge assembled on the equipment. MAX 690 bar.
- The pre-charge pressure must be a maximum of 9/10 of the minimum working pressure and, at least 1/4 of the maximum working pressure.
- Check the pre-charge pressure after two or three months and, then, every 6 months.

Pressure control or reduction

For this operation, the hose (6) and the pressure reducer (7) are not necessary.

Discharge the pressure in the hydraulic circuit.

Remove the safety cap (8a) on the pre-charge valve 1/4" GAS (8) on the accumulator / dampener.

Assemble the pre-charge device by screwing in the nut (1) on the accumulator valve. (8), ensuring the relief valve (2) is closed and the cap (5a) is fully screwed in.

Screw in without tightening the handwheel (4) and read the charge pressure on the gauge (3); if it is too high, open the relief valve (2) slightly.

Unscrew the handwheel (4) and discharge the residual pressure on the pre-charge device using the relief valve (2).

Remove the pre-charge device and replace the safety cap (8a) on the valve (8) of the accumulator.

Increasing pre-charge pressure

To pre-charge or increase the pre-charge pressure of the accumulators, remove the safety cap (8a) of the valve (8) on the accumulator/dampener.

Remove the cap (5a) and connect the hose (6) to the fitting (5) and to the pressure reducer (7) assembled on the nitrogen cylinder.

Assemble the pre-charge device by screwing in the ring nut (1) on the accumulator valve (8), ensuring the relief valve (2) is closed.

Screw in, without forcing, the handwheel (4) and slowly open the nitrogen cylinder tap. Checking the gauge (3), increase the pre-charge pressure, using the adjustment knob on the pressure reducer (7), to the value slightly over that desired.

Unscrew the handwheel (4), close the cylinder tap and empty the hose (6) opening the valve (2).

Remove the hose (6), put the cap (5a) back on the fitting (5) and wait a few minutes.

Screw in the handwheel (4) and check the pressure: if it is correct, unscrew the handwheel (4), remove the device by unscrewing the nut (1) and replace the protective cap (8a) on the valve (8); if not exact, increase or reduce the pressure as indicated above.

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