

CLAIMS

1. A pumping unit, comprising:
a rough-vacuum pump;
a Roots vacuum pump comprising a pumping stage having a stator inside which two
Roots rotors are configured to rotate synchronously in opposite directions to drive
a gas to be pumped between an inlet orifice and an outlet orifice; and
a pipeline connecting the outlet orifice to an intake of the rough-vacuum pump,
wherein a shortest distance between an edge of the outlet orifice and surfaces of each
of the Roots rotors in the pumping stage is less than 3 cm, the outlet orifice being
situated at the end of an upstream tube of the pipeline that passes into the
pumping stage.
2. The pumping unit according to claim 1, wherein the shortest distance is less than 2 cm.
3. The pumping unit according to claim 1, wherein the shortest distance is greater than 0.1
cm.
4. The pumping unit according to claim 1, wherein the outlet orifice has a circular shape, a
diameter of which is less than 5 cm.
5. The pumping unit according to claim 1, wherein the outlet orifice has a circular shape, a
diameter of which is between 2 cm and 5 cm.
6. The pumping unit according to claim 1, wherein the upstream tube projects from an
outlet receptacle of the pumping stage.
7. The pumping unit according to claim 6, wherein at least a bottom of the outlet
receptacle is removable.
8. The pumping unit according to claim 6, wherein the outlet receptacle has, for one part, a
circumferential portion formed in the stator of the pumping stage and, for another part, a bottom
fastened to the upstream tube of the pipeline.
9. The pumping unit according to claim 1, further comprising a cooling circuit configured
to at least partially cool the upstream tube of the pipeline.

10. The pumping unit according to claim 9, wherein the cooling circuit includes a jacket surrounding a base of the upstream tube of the pipeline, an inlet, and an outlet of the jacket allowing a coolant to flow through a volume of the double wall formed by the jacket and the upstream tube.

11. The pumping unit according to claim 10, wherein the inlet is situated at the end of an inlet pipe of the cooling circuit and the outlet is situated at the end of an outlet pipe of the cooling circuit, the inlet pipe and outlet pipe projecting into the volume of the double wall.

12. The pumping unit according to claim 11, wherein the length of the outlet pipe is greater than the length of the inlet pipe.

13. The pumping unit according to claim 1, further comprising a frame configured to support the Roots vacuum pump, wherein the pipeline has a downstream portion that is detachable from the upstream tube.

14. The pumping unit according to claim 13, wherein the downstream portion has a bellows.

15. The pumping unit according to claim 1, wherein the pipeline is straight.

16. A pumping unit, comprising:
a rough-vacuum pump;
a Roots vacuum pump comprising a pumping stage having a stator inside which two Roots rotors are configured to rotate synchronously in opposite directions to drive a gas to be pumped between an inlet orifice and an outlet orifice; and
a pipeline connecting the outlet orifice to an intake of the rough-vacuum pump, wherein the outlet orifice is situated at the end of an upstream tube of the pipeline that passes into the pumping stage.

17. The pumping unit according to claim 16, wherein the upstream tube projects from an outlet receptacle of the pumping stage.

18. The pumping unit according to claim 16, further comprising a cooling circuit configured to at least partially cool the upstream tube of the pipeline.

19. The pumping unit according to claim 18, wherein the cooling circuit includes a jacket surrounding a base of the upstream tube of the pipeline, an inlet, and an outlet of the jacket allowing a coolant to flow through a volume of the double wall formed by the jacket and the upstream tube.

20. The pumping unit according to claim 19, wherein the inlet is situated at the end of an inlet pipe of the cooling circuit and the outlet is situated at the end of an outlet pipe of the cooling circuit, the inlet pipe and outlet pipe projecting into the volume of the double wall.