

Title (en)
Vacuum pump with at least one pump stage

Title (de)
Vakuumpumpe mit wenigstens einer Pumpstufe

Title (fr)
Pompe à vide dotée d'au moins un étage

Publication
EP 3067560 B1 20201118 (DE)

Application
EP 15158724 A 20150312

Priority
EP 15158724 A 20150312

Abstract (en)
[origin: JP2016169731A] PROBLEM TO BE SOLVED: To provide a method capable of prolonging a service life of an abradable seal in a vacuum pump, and detecting abrasion of the seal in the vacuum pump early. SOLUTION: A vacuum pump 101 has at least one pump stage, a motor and a motor control part. In the vacuum pump that is a dry operation type vacuum pump having an abradable seal 148, at least one pressure sensor 51 is provided ahead of a first pump stage and/or in at least one compression chamber in the vacuum pump. The pressure sensor 51 is connected to an evaluation unit 53. SELECTED DRAWING: Figure 3

IPC 8 full level
F04C 23/00 (2006.01); **F04B 37/14** (2006.01); **F04B 39/04** (2006.01); **F04B 49/20** (2006.01); **F04C 18/02** (2006.01); **F04C 25/02** (2006.01); **F04C 28/08** (2006.01); **F04C 29/00** (2006.01)

CPC (source: EP)
F04B 37/14 (2013.01); **F04B 39/041** (2013.01); **F04B 49/20** (2013.01); **F04C 18/0215** (2013.01); **F04C 23/001** (2013.01); **F04C 25/02** (2013.01); **F04C 28/08** (2013.01); **F04C 29/0085** (2013.01); **F04B 2205/01** (2013.01); **F04B 2205/03** (2013.01); **F04C 2220/12** (2013.01); **F04C 2270/0525** (2013.01); **F04C 2270/185** (2013.01)

Citation (opposition)
Opponent : Edwards Limited,
• US 2014322055 A1 20141030 - CALHOUN JOHN [US]
• CA 2752655 A1 20130313 - ALLAN R NELSON ENGINEERING 1997 INC [CA]
• US 5718565 A 19980217 - KUHN MONIKA [DE], et al
• JP 2006322405 A 20061130 - DENSO CORP
• US 2001001950 A1 20010531 - KAWAMURA TAKESHI [JP], et al

Cited by
EP3647599B1; US2021102536A1; CN111043007A; US11773849B2

Designated contracting state (EPC)
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EP 3067560 A1 20160914; EP 3067560 B1 20201118; JP 2016169731 A 20160923; JP 6188850 B2 20170830

DOCDB simple family (application)
EP 15158724 A 20150312; JP 2016039622 A 20160302