

Allgemeine bauaufsichtliche Zulassung

Zulassungsstelle für Bauprodukte und Bauarten

Bautechnisches Prüfamt

Eine vom Bund und den Ländern
gemeinsam getragene Anstalt des öffentlichen Rechts
Mitglied der EOTA, der UEAtc und der WFTAO

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Zulassungsnummer:

Z-53.6-492

Geltungsdauer

vom: **13. August 2015**

bis: **13. August 2020**

Antragsteller:

Jets Vacuum A/S

Myravegen 1
6060 HAREID
NORWEGEN

Zulassungsgegenstand:

Unterdruckentwässerungssystem mit der Bezeichnung "JETS VACUUM SYSTEM"

Der oben genannte Zulassungsgegenstand wird hiermit allgemein bauaufsichtlich zugelassen.
Diese allgemeine bauaufsichtliche Zulassung umfasst neun Seiten und 29 Anlagen.

DIBt

I ALLGEMEINE BESTIMMUNGEN

- 1 Mit der allgemeinen bauaufsichtlichen Zulassung ist die Verwendbarkeit bzw. Anwendbarkeit des Zulassungsgegenstandes im Sinne der Landesbauordnungen nachgewiesen.
- 2 Sofern in der allgemeinen bauaufsichtlichen Zulassung Anforderungen an die besondere Sachkunde und Erfahrung der mit der Herstellung von Bauprodukten und Bauarten betrauten Personen nach den § 17 Abs. 5 Musterbauordnung entsprechenden Länderregelungen gestellt werden, ist zu beachten, dass diese Sachkunde und Erfahrung auch durch gleichwertige Nachweise anderer Mitgliedstaaten der Europäischen Union belegt werden kann. Dies gilt ggf. auch für im Rahmen des Abkommens über den Europäischen Wirtschaftsraum (EWR) oder anderer bilateraler Abkommen vorgelegte gleichwertige Nachweise.
- 3 Die allgemeine bauaufsichtliche Zulassung ersetzt nicht die für die Durchführung von Bauvorhaben gesetzlich vorgeschriebenen Genehmigungen, Zustimmungen und Bescheinigungen.
- 4 Die allgemeine bauaufsichtliche Zulassung wird unbeschadet der Rechte Dritter, insbesondere privater Schutzrechte, erteilt.
- 5 Hersteller und Vertreiber des Zulassungsgegenstandes haben, unbeschadet weiter gehender Regelungen in den "Besonderen Bestimmungen", dem Verwender bzw. Anwender des Zulassungsgegenstandes Kopien der allgemeinen bauaufsichtlichen Zulassung zur Verfügung zu stellen und darauf hinzuweisen, dass die allgemeine bauaufsichtliche Zulassung an der Verwendungsstelle vorliegen muss. Auf Anforderung sind den beteiligten Behörden Kopien der allgemeinen bauaufsichtlichen Zulassung zur Verfügung zu stellen.
- 6 Die allgemeine bauaufsichtliche Zulassung darf nur vollständig vervielfältigt werden. Eine auszugsweise Veröffentlichung bedarf der Zustimmung des Deutschen Instituts für Bautechnik. Texte und Zeichnungen von Werbeschriften dürfen der allgemeinen bauaufsichtlichen Zulassung nicht widersprechen. Übersetzungen der allgemeinen bauaufsichtlichen Zulassung müssen den Hinweis "Vom Deutschen Institut für Bautechnik nicht geprüfte Übersetzung der deutschen Originalfassung" enthalten.
- 7 Die allgemeine bauaufsichtliche Zulassung wird widerruflich erteilt. Die Bestimmungen der allgemeinen bauaufsichtlichen Zulassung können nachträglich ergänzt und geändert werden, insbesondere, wenn neue technische Erkenntnisse dies erfordern.

II BESONDERE BESTIMMUNGEN

1 Zulassungsgegenstand und Anwendungsbereich

Diese allgemeine bauaufsichtliche Zulassung gilt für das Unterdruckentwässerungssystem mit der Bezeichnung "Jets Vacuum System", bestehend aus den Komponenten

- WC-Becken (Typ "CHARM", Typ "610SS", Typ "50M", Typ "59M" und Typ "Pearl"),
- Urinal-Becken (Typ "720SS" und Typ "Sphinx 70"),
- Sammelbehälter (16 Liter) aus Polyethylen (PE-MD) oder Edelstahl,
- Unterdruckerzeuger "Vacuumarator MBA95",
- Unterdruckventil "D-Valve",
- Vakuumunterbrecher,
- Steuereinheit "VPC-V Controller",
- Installationsrahmen (Typ "Pearl", Typ "Charm" und Typ "59M") und
- Auslöseknöpfe (verschiedene Ausführungen).

Unterdruckerzeuger und Steuereinheit werden als vormontiertes Gesamtsystem geliefert.

Der Unterdruckerzeuger erzeugt mittels einer rotierenden Spiralwelle fortwährend (ohne zusätzliches Puffervolumen) und je nach Bedarf einen Unterdruck von -0,40 bar bis -0,55 bar (*Vacuum-On-Demand-System*) und transportiert das angesaugte Abwasser-Luft-Gemisch in das druckseitig angeschlossene Entwässerungssystem. Auf der Saugseite des Unterdruckerzeugers ist ein Mazerator zur Zerkleinerung von im Abwasser enthaltenen Feststoffen installiert.

Die WC- und Urinal-Becken werden mittels der zugehörigen Installationsrahmen installiert.

Die Unterdruckventile sind in die WC- und Urinal-Becken integriert, und dienen der Abdichtung des Systems zur umgebenden Atmosphäre. Zum Absaugen/Spülen wird das Ventil (durch Betätigen des Auslöseknopfes) geöffnet. Hierbei werden bei jedem Absaug-/Spülvorgang zusätzlich zu dem anfallenden Schwarzwasser ein Liter Frischwasser und 60 Liter Luft in das System eingesaugt.

Die Sammelbehälter dürfen nur als Grauwasserbehälter verwendet werden. Sie können bei Bedarf in das Unterdruckentwässerungssystem integriert werden, um den zusätzlichen Anschluss von Handwaschbecken, Duschen, Badewannen, etc. zu ermöglichen.

Zum Schutz des Trinkwassers vor Verunreinigungen in der angeschlossenen Trinkwasser-Installationen entsprechend der Festlegungen von DIN EN 1717¹ ist der Vakuumunterbrecher zu installieren.

Das Unterdruckentwässerungssystem darf in Verbindung mit Abwasserrohren und Formstücken der Nennweite DN 32 oder DN 50 aus

- Polyethylen (PE-HD) nach DIN EN 1519-1² bzw. DIN EN 12666-1³,
- Edelstahl nach DIN EN 1124-1⁴ (Typ "Blücher") oder

- | | | |
|---|----------------|---|
| 1 | DIN EN 1717 | Schutz des Trinkwassers vor Verunreinigungen in Trinkwasser-Installationen und allgemeine Anforderungen an Sicherungseinrichtungen zur Verhütung von Trinkwasserunreinigungen durch Rückfließen; Deutsche Fassung EN 1717:2000; Technische Regel des DVGW |
| 2 | DIN EN 1519-1 | Kunststoff-Rohrleitungssysteme zum Ableiten von Abwasser (niedriger und hoher Temperatur) innerhalb der Gebäudestruktur – Polyethylen (PE) – Teil 1: Anforderungen an Rohre, Formstücke und das Rohrleitungssystem; Deutsche Fassung EN 1519-1:1999; Ausgabe: 2000-01 |
| 3 | DIN EN 12666-1 | Kunststoff-Rohrleitungssysteme für erdverlegte Abwasserkanäle und -leitungen -Polyethylen (PE) –Teil-1: Anforderungen an Rohre, Formstücke und das Rohrleitungssystem; Deutsche Fassung EN 12666-1:2005+A1:2011; Ausgabe: 2011-11 |

- feuerverzinkte Stahlabflussrohre nach DIN EN 1123-1⁵ ("LoRo X") zur Ableitung von Abwasser innerhalb von Gebäuden verwendet werden.

Das Unterdruckentwässerungssystem ist für den Einsatz in Entwässerungsanlagen für Gebäude und Grundstücke entsprechend DIN 1986-100⁶ bestimmt, in denen ein regelmäßiger Wartungs- und Reinigungsdienst sichergestellt ist. Es darf nur für die Ableitung von Abwasser nach DIN 1986-3⁷ verwendet werden, das keine höheren Temperaturen aufweist als solche, die in DIN EN 476⁸ genannt sind.

2 Bestimmungen für das Bauprodukt

2.1 Eigenschaften und Zusammensetzung

2.1.1 Allgemeines

Die Abmessungen, die sonstigen Angaben und die Konstruktion der einzelnen Komponenten des Unterdruckentwässerungssystems entsprechen den Angaben der Anlagen 1 bis 18.

Alle Teile, die mit Abwasser und feuchter Luft in Berührung kommen, bestehen aus korrosionsunempfindlichen Werkstoffen oder sind korrosionsgeschützt.

Die elektrischen Einrichtungen müssen den jeweils gültigen VDE-Vorschriften entsprechen.

2.1.2 Unterdruckerzeuger "Vacuumator MBA95"

Die Unterdruckerzeugung und Abwasserförderung erfolgt durch eine Multiphasenpumpe mit der Typenbezeichnung "Jets 95MB".

Der Unterdruckerzeuger entspricht einschließlich Pumpe und Motor mindestens der Schutzklasse IP 55.

Funktionsprinzip sowie Pumpen- und Energieverbrauchskennlinien des Unterdruckerzeugers entsprechen den Angaben in den Anlagen 19 bis 26.

Aufbau und technische Daten des Pumpenmotors entsprechen den Angaben in den Anlagen 27 und 28.

2.1.3 Steuereinheit "VPC-V Controller"

Die Steuereinheit ist werkseitig am Unterdruckerzeuger vorinstalliert und entspricht mindestens der Schutzart IP 44.

Die Bedienung der Steuerungseinrichtung erfolgt mittels zentraler Kontrolleinheit, und verfügt mindestens über folgende Grundausstattung:

- 1 Hauptschalter zum Ein- bzw. Ausschalten der Gesamtanlage und
- 1 Anzeigergerät zum Ablesen des Betriebszustandes.

Mittels des Anzeigergerätes können folgende Informationen abgelesen und protokolliert:

- Anzeige des anstehenden Unterdrucks,
- Anzeige zu niedriger Unterdruck und
- Laufzeitalarm.

4	DIN EN 1124-1	Rohre und Formstücke aus längsnahtgeschweißtem, nicht rostendem Stahlrohr mit Steckmuffe für Abwasserleitungen – Teil 1: Anforderungen, Prüfungen, Güteüberwachung; Deutsche Fassung EN 1124-1:1999 + A1:2004; Ausgabe:2004-12 in Verbindung Berichtigung 1, Ausgabe: 2006-01
5	DIN EN 1123-1	Rohre und Formstücke aus längsnahtgeschweißtem, feuerverzinktem Stahlrohr mit Steckmuffe für Abwasserleitungen – Teil 1: Anforderungen, Prüfungen, Güteüberwachung; Deutsche Fassung EN 1123-1:1999 + A1:2004; Ausgabe: 2004-12
6	DIN 1986-100	Entwässerungsanlagen für Gebäude und Grundstücke – Teil 100: Bestimmungen in Verbindung mit DIN EN 752 und DIN EN 12056; Ausgabe: 2008-05
7	DIN 1986-3	Entwässerungsanlagen für Gebäude und Grundstücke – Teil 3: Regeln für Betrieb und Wartung; Ausgabe: 2004-11
8	DIN EN 476	Allgemeine Anforderungen an Bauteile für Abwasserleitungen und -kanäle; Deutsche Fassung EN 476:2011; Ausgabe: 2011-04

2.1.4 **Sammelbehälter**

Die Sammelbehälter werden aus Polyethylen mittlerer Dichte (PE-MD) welches den Anforderungen von DIN EN 1519-1² bzw. DIN EN 12666-1³ entspricht oder Edelstahl der Werkstoffnummer WNr. 1.4401 (AISI 316) nach DIN EN 1124-1⁴ gefertigt und entsprechen in Form und Abmessungen den Angaben in den Anlagen 7 bis 10.

Die Sammelbehälter verfügen jeweils über eine Einlass-, eine Auslass- und einer Druckausgleichsöffnung den Nennweite DN 50 die gleichzeitig als Notüberlauf dient.

Das Speichervolumen der Sammelbehälter beträgt 16 Liter.

Das Unterdruckventil "D-Valve" (vgl. Abs. 2.1.6) ist auf der Oberseite des jeweiligen Sammelbehälters fest montiert und ist mittels einer Steigleitung mit dem Innenraum des Sammelbehälters verbunden.

2.1.5 **Entwässerungsgegenstände**

Die WC- und die Urinal-Becken sind aus

- glasierter Keramik (Typ "CHARM", Typ "50M", Typ "59M", Typ "Pearl", Typ "Sphinx 70") oder
- Edelstahl (Typ "610SS", Typ "720SS")

gefertigt und entsprechen in ihrer Form und ihren Abmessungen den Angaben der Anlagen 1 bis 6.

Die Vorwandinstallation erfolgt in Verbindung mit den jeweiligen Installationsrahmen und Auslöseknöpfen.

2.1.6 **Unterdruckventil "D-Valve"**

Das Unterdruckventil entspricht in Form, Zusammensetzung und Abmessungen den Angaben der Anlage 11.

2.1.7 **Vakuumentreiber**

Die Vakuumentreiber entsprechen in Form, Zusammensetzung und Abmessungen den Angaben der Anlage 29.

2.1.8 **Rohrsystem**

2.1.8.1 Allgemeines

Für die Rohrleitungen, die mit Unterdruck oder Druck betrieben werden sowie deren Verbindungen an Ventile, dürfen nur Rohre mit einem Nenndruck von mindestens PN 6 verwendet werden. Für die Verbindungen im Bereich der Vakuumentreiber ist ein Nenndruck von mindestens PN 10 einzuhalten.

Die DVGW-W Prüfgrundlagen sind hinsichtlich der Anforderungen an die Dichtheit gegen Unter- bzw. Überdruck einzuhalten.

Diejenigen Rohre und Formstücke, die für den ausschließlichen drucklosen Betrieb als Grauwasserleitungen von den Entwässerungsgegenständen wie Waschbecken, Badewannen, Duschen usw. bis zu dem jeweiligen Sammelbehälter bestimmt sind, sind mit natürlichem Gefälle (Schwerkraftprinzip) und unter Berücksichtigung der Festlegung von DIN 1986-100⁹ herzustellen. Hierfür dürfen nur heißwasserbeständige Abwasserleitungen verwendet werden. Bei der Auswahl der Werkstoffe dieser Rohre und Formstücke sind die Festlegungen von DIN 1986-4¹⁰ zu beachten.

2.1.8.2 Rohre und Formstücke aus PE-HD

Die Rohre und Formstücke bestehen aus hochdichtem Polyethylen (PE-HD) nach DIN EN 1519-1² bzw. DIN EN 12666-1³. Werden diese mit Unterdruck betrieben müssen

⁹ DIN 1986-100 Entwässerungsanlagen für Gebäude und Grundstücke – Teil 100: Bestimmungen in Verbindung mit DIN EN 752 und DIN EN 12056; Ausgabe: 2008-05

¹⁰ DIN 1986-4 Entwässerungsanlagen für Gebäude und Grundstücke – Teil 4: Verwendungsbereiche von Abwasserrohren und -formstücken verschiedener Werkstoffe; Ausgabe: 2011-12

Rohre, Formstücke und PE-Formmasse mindestens die Anforderungen von DIN EN 12201-1¹¹ erfüllen.

2.1.8.3 Rohre und Formstücke aus Edelstahl

Die Rohre und Formstücke bestehen aus Edelstahl nach DIN EN 1124-1⁴ mit der Werkstoffnummer WNr. 1.4401 (AISI 316).

2.1.8.4 Rohre und Formstücke aus feuerverzinktem Stahl

Die feuerverzinkten Stahlrohre ("LoRo X") entsprechen den Bestimmungen der DIN EN 1123-1⁵.

2.1.9 Dichtmittel

Die elastomeren Dichtmittel für die Rohrverbindungen und für die Ventile entsprechen den Anforderungen von DIN EN 681-1¹².

2.2 Kennzeichnung

Das Unterdruckentwässerungssystem bzw. dessen Komponenten müssen vom Antragsteller mit dem Übereinstimmungszeichen (Ü-Zeichen) nach den Übereinstimmungszeichen-Verordnungen der Länder, einschließlich der Zulassung Nr. Z-53.6-492 gekennzeichnet werden. Die Kennzeichnung darf nur erfolgen, wenn die Voraussetzungen nach Abschnitt 2.3 erfüllt sind.

Zusätzlich sind mindestens einmal das Herstelljahr und das Herstellwerk deutlich sichtbar und dauerhaft in die Kennzeichnung aufzunehmen.

2.3 Übereinstimmungsnachweis

2.3.1 Allgemeines

Die Bestätigung der Übereinstimmung des Unterdruckentwässerungssystem bzw. von dessen Komponenten mit den Bestimmungen dieser allgemeinen bauaufsichtlichen Zulassung muss für jedes Herstellwerk mit einem Übereinstimmungszertifikat auf der Grundlage einer werkseigenen Produktionskontrolle und einer regelmäßigen Fremdüberwachung einschließlich einer Erstprüfung der Bestandteile des Unterdruckentwässerungssystems nach Maßgabe der folgenden Bestimmungen erfolgen.

Für die Erteilung des Übereinstimmungszertifikats und die Fremdüberwachung einschließlich der dabei durchzuführenden Produktprüfungen hat der Antragsteller eine hierfür anerkannte Zertifizierungsstelle sowie eine hierfür anerkannte Überwachungsstelle einzuschalten.

Die Erklärung, dass ein Übereinstimmungszertifikat erteilt ist, hat der Antragsteller durch Kennzeichnung der Bauprodukte mit dem Übereinstimmungszeichen (Ü-Zeichen) unter Hinweis auf den Verwendungszweck abzugeben.

Dem Deutschen Institut für Bautechnik ist von der Zertifizierungsstelle eine Kopie des von ihr erteilten Übereinstimmungszertifikats zur Kenntnis zu geben.

Dem Deutschen Institut für Bautechnik ist zusätzlich eine Kopie des Erstprüfberichts zur Kenntnis zu geben.

2.3.2 Werkseigene Produktionskontrolle

In jedem Herstellwerk ist eine werkseigene Produktionskontrolle einzurichten und durchzuführen. Unter werkseigener Produktionskontrolle wird die vom Antragsteller vorzunehmende kontinuierliche Überwachung der Produktion verstanden, mit der dieser sicherstellt, dass die von ihm hergestellten Bauprodukte den Bestimmungen dieser allgemeinen bauaufsichtlichen Zulassung entsprechen.

¹¹ DIN EN 12201-1 Kunststoff-Rohrleitungssysteme für die Wasserversorgung - Polyethylen (PE) - Teil 1: Allgemeines; Deutsche Fassung EN 12201-1:2003; Ausgabe: 2003-06

¹² DIN EN 681-1 Elastomer-Dichtungen - Werkstoff-Anforderungen für Rohrleitungs-Dichtungen für Anwendungen in der Wasserversorgung und Entwässerung – Teil 1: Vulkanisierter Gummi; Deutsche Fassung EN 681-1:1996 + A1:1998 + A2:2002 + AC:2002 + A3:2005; Ausgabe: 2006-11

Die werkseigene Produktionskontrolle muss mindestens die im Folgenden aufgeführten Maßnahmen einschließen:

– Beschreibung und Überprüfung des Ausgangsmaterials und der Bestandteile:

Die Eigenschaften der verwendeten Werkstoffe und dessen Überprüfung muss den Festlegungen des Abschnittes 2.1 entsprechen. Dies hat sich der Hersteller des Unterdruckentwässerungssystems vom vorlieferanten bei jeder Lieferung durch Vorlage einer Werksbescheinigung 2.1 in Anlehnung an DIN EN 10204¹³ bestätigen zu lassen.

Die Einhaltung der Übereinstimmung der Elastomerdichtungen mit den in Abschnitt 2.1.9 getroffenen Feststellungen hat sich der Hersteller die aufgrund von DIN EN 681-1¹¹ erforderliche CE-Kennzeichnung mit der Konformitätserklärung/Leistungserklärung des Herstellers vorlegen zu lassen.

– Nachweise und Prüfungen, die am fertigen Bauprodukt durchzuführen sind:

Die Festlegungen zu den Abmessungen des Unterdruckentwässerungssystems bzw. von dessen Komponenten in Abschnitt 2.1 sind während der Herstellung stichprobenartig zu prüfen.

Die Funktion der einzelnen Komponenten des Unterdruckentwässerungssystems ist während der Herstellung stichprobenartig zu prüfen.

Die Einhaltung der Festlegungen zur Kennzeichnung in Abschnitt 2.2.3 sind ständig während der Fertigung zu überprüfen.

Die Ergebnisse der werkseigenen Produktionskontrolle sind aufzuzeichnen. Die Aufzeichnungen müssen mindestens folgende Angaben enthalten:

- Bezeichnung des Bauprodukts bzw. des Ausgangsprodukts und der Bestandteile,
- Art der Kontrolle oder Prüfung,
- Datum der Herstellung und der Prüfung des Bauprodukts bzw. des Ausgangsmaterials,
- Ergebnis der Kontrollen und Prüfungen und, soweit zutreffend, Vergleich mit den Anforderungen und
- Unterschrift des für die werkseigene Produktionskontrolle Verantwortlichen.

Die Aufzeichnungen sind mindestens fünf Jahre aufzubewahren und der für die Fremdüberwachung eingeschalteten Überwachungsstelle vorzulegen. Sie sind dem Deutschen Institut für Bautechnik und der zuständigen obersten Bauaufsichtsbehörde auf Verlangen vorzulegen.

Bei ungenügendem Prüfergebnis sind vom Antragsteller unverzüglich die erforderlichen Maßnahmen zur Abstellung des Mangels zu treffen. Bauprodukte, die den Anforderungen nicht entsprechen, sind so zu handhaben, dass Verwechslungen mit übereinstimmenden ausgeschlossen werden. Nach Abstellung des Mangels ist - soweit technisch möglich und zum Nachweis der Mängelbeseitigung erforderlich - die betreffende Prüfung unverzüglich zu wiederholen.

2.3.3 Fremdüberwachung

In jedem Herstellwerk ist die werkseigene Produktionskontrolle durch eine Fremdüberwachung regelmäßig zu prüfen, mindestens jedoch zweimal jährlich.

Für die Fremdüberwachung sind Stichprobenprüfungen durchzuführen. Die Probenahme und Prüfungen obliegen jeweils der anerkannten Überwachungsstelle.

Die Ergebnisse der Zertifizierung und Fremdüberwachung sind mindestens fünf Jahre aufzubewahren. Sie sind von der Zertifizierungsstelle bzw. der Überwachungsstelle dem Deutschen Institut für Bautechnik und der zuständigen obersten Bauaufsichtsbehörde auf Verlangen vorzulegen.

¹³

DIN EN 10204

Metallische Erzeugnisse - Arten von Prüfbescheinigungen; Deutsche Fassung EN 10204:2004; Ausgabe: 2005-01

3 Bestimmungen für den Entwurf

3.1 Konstruktion

Bei dem Entwurf des Unterdruck-Entwässerungssystems sind die Installationsempfehlungen des Herstellers sowie die jeweilige Bauwerksplanung (Entwurfs- und Ausführungszeichnungen der baulichen Anlage) zu berücksichtigen.

Für die Installation der Druckleitungen gilt DIN EN 12109¹⁴, für die Installation der Freispiegelleitungen gilt DIN EN 12056¹⁵ in Verbindung mit DIN 1986-100⁵.

Die Größe des Unterdrucks ist so festzulegen, dass eine sichere Ableitung des Abwassers ohne Verstopfung erreicht wird. Es ist ein Unterdruck von mindestens 0,4 bar vorzuhalten. Wird Abwasser durch Unterdruck von unten nach oben weitergeleitet, darf eine maximale Druckhöhe von 5 m nicht überschritten werden.

In das Druckleitungssystem sind in Abständen von 8 bis 10 m Transporttaschen einzubauen, um für den sicheren Transport des anfallenden Grau- und Schwarzwassers die jeweils erforderlichen Vakuumniveaus zur Verfügung zu stellen.

Für jeden Anwendungsfall ist die Leistung der Pumpen (in kW) anzugeben.

3.2 Anschlüsse der Trinkwasserleitungen

Bei der Verbindung von Trinkwasseranlagen mit dem Unterdruckentwässerungssystem sind die Anforderungen nach DIN EN 1717¹ in Verbindung mit DIN 1988-100¹⁶ einzuhalten.

3.3 Schallschutz

Bei Planung und Installation des Unterdruckentwässerungssystems sind die Bestimmungen der DIN 4109¹⁷ zu beachten.

3.4 Brandschutz

Bei Planung und Installation des Unterdruckentwässerungssystems sind die Bestimmungen der DIN 4102-1¹⁸ zu beachten.

4 Bestimmungen für die Ausführung

Während der Montage des Unterdruckentwässerungssystems muss ein Montageleiter oder ein fachkundiger Vertreter auf der Baustelle anwesend sein. Er hat für die ordnungsgemäße Ausführung der Arbeiten nach den Bestimmungen dieser allgemeinen bauaufsichtlichen Zulassung zu verantworten.

Er hat außerdem eine Abnahmeprüfung durchzuführen, wobei die ordnungsgemäße Funktion des Unterdruckentwässerungssystems zu überprüfen ist. Dabei ist insbesondere eine Dichtheitskontrolle der Rohrleitungen durchzuführen.

Von der Abnahmeprüfung ist ein Protokoll zu fertigen.

14	DIN EN 12109	Unterdruckentwässerungssysteme innerhalb von Gebäuden; Deutsche Fassung EN 12109:1999; Ausgabe: 1999-06
15	DIN EN 12056-1	Schwerkraftentwässerungsanlagen innerhalb von Gebäuden – Teil 1: Allgemeine und Ausführungsanforderungen; Deutsche Fassung EN 12056-1:2000; Ausgabe: 2001-01
16	DIN 1988-100	Technische Regeln für Trinkwasser-Installationen - Teil 100: Schutz des Trinkwassers, Erhaltung der Trinkwassergüte; Technische Regel des DVGW: Ausgabe: 2011-08
17	DIN 4109	Schallschutz im Hochbau; Anforderungen und Nachweise; Ausgabe:1989-11
18	DIN 4102-1	Brandverhalten von Baustoffen und Bauteilen – Teil 1: Baustoffe; Begriffe, Anforderungen und Prüfungen; Ausgabe:1998-05 in Verbindung mit Berichtigung 1; Ausgabe: 1998-08

5 Bestimmungen für Nutzung, Unterhalt, Wartung

Nutzungs- und Wartungsanweisungen des Herstellers sind zu beachten.

Beim Betrieb und bei der Wartung des Unterdruckentwässerungssystems sind die einschlägigen Unfallverhütungsvorschriften zu beachten.

Rudolf Kersten
Referatsleiter

Beglaubigt



Jets™ Toilet 610
 Product No. TO610SS

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued 2014-02-01 | Rev 1.0



Jets™ floor mounted stainless steel toilet design is a vacuum toilet designed for demanding applications.

Features:

- Low water consumption
- Design optimized for easy maintenance.
- Reliable flush and discharge.

Warranty

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Technical Data

Outside Dimensions.....	665 x 384 x 462 mm (LxWxH)
Weight.....	17 kg
Discharge Valve Outlet.....	Outside diameter Ø 50 mm
Water Connection.....	1/2" male BSP
Generic Material.....	AISI 316

Operating Data

Flushing Time.....	5 seconds
Discharge Time.....	2 seconds
Water Pressure.....	2-7 bar
Operating Vacuum.....	Recommended 30-55 % Vacuum
Air Consumption.....	Approx. 48 liters at 50% Vacuum
Water Consumption.....	1 liter/s (3 bar) (adjustable)
Temperature Range.....	Minimum 1°C to Maximum 60°C (unless frost protection measures are taken)

Note:.....Values are dependent on valve type.

Patents and Trademarks

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Options

Optional functions compatible with this product.

- VFD: Vacuum Flush and Discharge
- EFD: Electrical Flush and Discharge
- CFD: Central Flush and Discharge
- LFD: Local Flush and Discharge

Components

Construction Characteristics

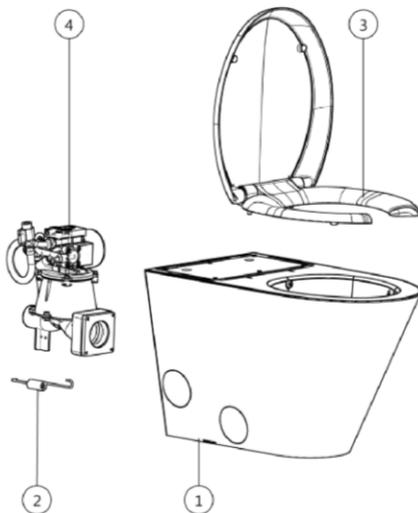
① Toilet Bowl JETS 610SS.....	065604500*
② Spring.....	053531720*
③ Seat & Cover.....	Product Selection
④ Valve.....	See options listed above

* Component/s available as replacement parts.

Accessories

Construction Characteristics

Vacuum Breaker Kit.....	034507320
Rubber Elbow w/hose clip.....	034505450
Rubber Sleeve w/hose clip.....	034505550
Rag Hook w/support.....	034102902
Pipe Packet.....	034399300



Jets Vacuum System
 Jets™ Toilet 610 (TO610SS)

Anhang 2

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway



Jets™ 50M Toilet
 Product No. TO650PO

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued | Rev 2014-08-12 09:01:14



Jets™ 50M Toilet is a pedestal pan design. With a focus on both simple elegant design and comfort, this floor mounted toilets contemporary look complements any installation.

Warranty

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Technical Data

Outside Dimensions.....525 x 365 x 465 mm (LxWxH)
 Weight.....19 kg
 General Tolerance.....Bowl dimensions ±2%
 Discharge Valve Outlet.....Outside diameter Ø 50 mm
 Water Connection.....½" male BSP
 Generic Material.....Porcelain

Operating Data

Flushing Time.....5 seconds
 Discharge Time.....2 seconds
 Water Pressure.....2-7 bar
 Operating Vacuum.....Recommended 30-55 % Vacuum
 Air Consumption.....Approx. 48 liters at 50% Vacuum
 Water Consumption.....1 liter/s (3 bar)
 Temperature Range.....Minimum 1°C
 to Maximum 60°C
 (unless frost protection measures are taken)

Note:.....Values are dependent on valve type.

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Options

Optional functions compatible with this product.

VFD: Vacuum Flush and Discharge
 EFD: Electrical Flush and Discharge
 CFD: Central Flush and Discharge
 LFD: Local Flush and Discharge

Components

Construction Characteristics

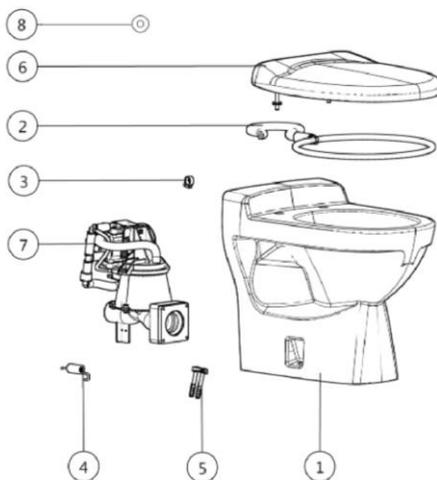
- ① Toilet Bowl JETS 50M.....063600100*
- ② Flushing ring.....069510500*
- ③ Hose Clip 13-20mm.....034233401*
- ④ Spring.....053531725*
- ⑤ Fastening Kit, floor.....069606301*
- ⑥ Seat & Cover.....See product selection
- ⑦ Valve.....See options listed above
- ⑧ Release Mechanism.....See product selection

* Component/s available as replacement parts.

Accessories

Construction Characteristics

- Vacuum Breaker Kit.....034507320
- Rubber Elbow w/hose clip.....034505450
- Rubber Sleeve w/hose clip.....034505550
- Rag Hook w/support.....034102902
- Pipe Packet.....034399300
- Cover, Complete.....063602121
- Base plate.....063608700



Jets Vacuum System
 Jets™ 50M Toilet (TO650PO)

Anhang 3

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway

elektronische kopie der abz des dibt: z-53.6-492



Jets™ 59M Toilet

Product No. TO659PO

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued | Rev 2014-08-12 09:00:38



Jets™ 59M Toilet is a wall hung pan design. With a focus on both simple elegant design and comfort, this wall mounted toilets contemporary look complements any installation.

Warranty

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Technical Data

Outside Dimensions.....530 x 360 x 420 mm (LxWxH)
 Weight.....20 kg
 General Tolerance.....Bowl dimensions ±2%
 Discharge Valve Outlet.....Outside diameter Ø 50 mm
 Water Connection.....½" male BSP
 Generic Material.....Porcelain

Operating Data

Flushing Time.....5 seconds
 Discharge Time.....2 seconds
 Water Pressure.....2-7 bar
 Operating Vacuum.....Recommended 30-55 % Vacuum
 Air Consumption.....Approx. 48 liters at 50% Vacuum
 Water Consumption.....1 liter/s (3 bar)
 Temperature Range.....Minimum 1°C
 to Maximum 60°C
 (unless frost protection measures are taken)

Note:.....Values dependent on valve type.

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Options

Optional functions compatible with this product.

VFD: Vacuum Flush and Discharge
 EFD: Electrical Flush and Discharge
 CFD: Central Flush and Discharge
 LFD: Local Flush and Discharge

Components

Construction Characteristics

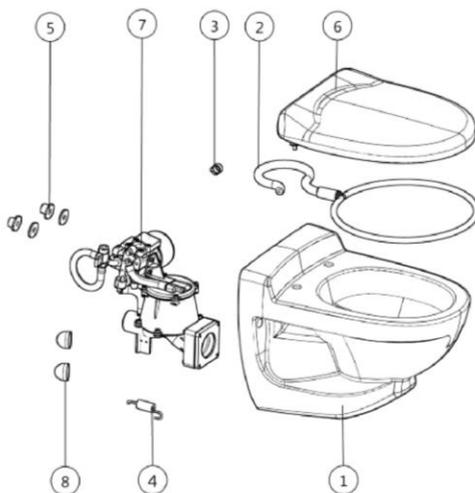
- ① Toilet Bowl JETS 59M.....066005000*
- ② Flushing ring.....069510500*
- ③ Hose Clip 13-20mm.....034233401*
- ④ Spring.....053531725*
- ⑤ Fastening Kit, wall.....069606400*
- ⑥ Seat & Cover.....Product Selection
- ⑦ Valve.....See options listed above
- ⑧ Cap.....069606304*

* Component/s available as replacement parts.

Accessories

Construction Characteristics

- Vacuum Breaker Kit.....034507320
- Rubber Elbow w/hose clip.....034505450
- Rubber Sleeve w/hose clip.....034505550
- Rag Hook w/support.....034102902
- Bracket, retrofit toilet.....069000300
- Bracket, retrofit toilet.....069000303
- Fastening Kit, wall - Land.....069606302
- Pipe Packet.....034399300



Jets Vacuum System
 Jets™ 59M Toilet (TO659PO)

Anhang 4

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway

elektronische kopie der abz des dibt: z-53.6-492



Jets™ Pearl Toilet
 Product No. TO614PO

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued 2013-08-21 | Rev 4.0



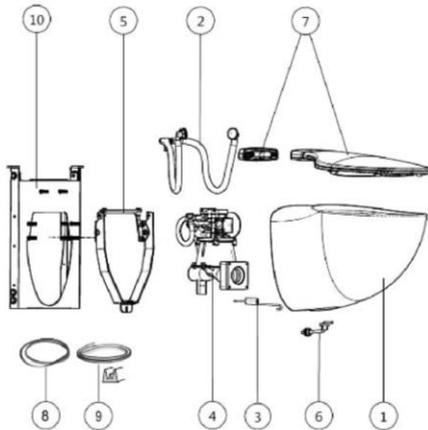
Pearl toilets simple and elegant award winning design ensures optimal hygiene and comfort. High quality porcelain in a wall mounted design compliments any installation.

Features:

- Low water consumption with reliable flush and discharge.
- Innovative hygienic nozzle flushing and seat design eliminate the need for an inside edge in the bowl, significantly reducing overall cleaning time in multi-toilet installations.
- Wall mounted soft-close seat and cover design improves hygiene.
- Easy service access and removal of the valve for maintenance.

Warranty

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Technical Data

Outside Dimensions.....580 x 355 x 455 mm (LxWxH)
 Weight.....27 kg
 General Tolerance.....Bowl dimensions ±2%
 Discharge Valve Outlet.....Outside diameter Ø 50 mm
 Water Connection.....½" male BSP

Operating Data

Water Pressure.....2-7 bar
 Operating Vacuum.....Recommended 30-55 % Vacuum
 Air Consumption.....Approx. 48 liters at 50% Vacuum
 Water Consumption.....1 liter/s (3 bar)
 Temperature Range..... Minimum 1°C
 to Maximum 60°C
 (unless frost protection measures are taken)

Patents and Trademarks

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Options

Optional functions compatible with this product.

VFD: Vacuum Flush and Discharge
 CFD: Central Flush and Discharge
 LFD: Local Flush and Discharge

Components

Construction Characteristics

- ① Toilet Bowl JETS Pearl.....066607200*
- ② Flushing Nozzle Kit.....069503111*
- ③ Spring.....053531720*
- ④ Valve.....See options listed above
- ⑤ Toilet Console Pearl.....069000114*
- ⑥ Mounting Kit, Pearl.....069606408*
- ⑦ Seat & Cover, Pearl.....069608871*
- ⑧ Coaming.....037609312*
- ⑨ Gasket.....037609321*
- ⑩ Mounting Frame Pearl.....if selected

* Component/s available as replacement parts.

Accessories

Construction Characteristics

- Vacuum Breaker Kit.....034507320
- Rubber Elbow w/hose clip.....034505450
- Rubber Sleeve w/hose clip.....034505550
- Rag Hook w/support.....034102902
- Mounting Kit, Pearl LT.....069606409
- Pipe Fixture, Pearl.....034608310
- Pipe Packet.....034399300

Jets Vacuum System
 Jets™ Pearl Toilet (TO614PO)

Anhang 5

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway

elektronische kopie der abz des dibt: z-53.6-492



Jets™ Charm Toilet
 Product No. TO611PO

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued 2013-10-28 | Rev 3.0



With a focus on elegant contemporary design and comfort, the wall mounted porcelain toilet complements any installation.

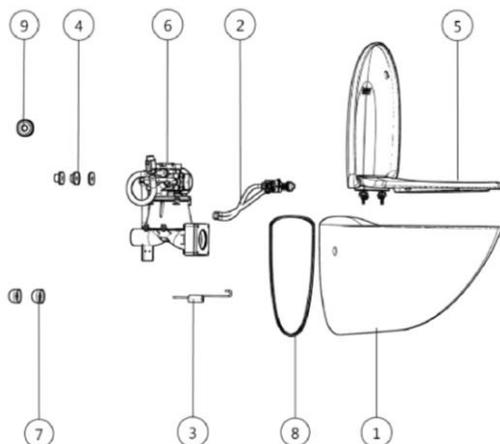
- Low water consumption with reliable flush and discharge.
- Easy to clean with no inside edge. Designed for easy maintenance.
- High quality vitreous china bowl with hygienic nozzle flushing.

Warranty

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Technical Data

Outside Dimensions.....	540 x 370 x 400 mm (LxWxH)
Weight.....	22.5 kg
General Tolerance.....	Bowl dimensions ±2%
Discharge Valve Outlet.....	Outside diameter Ø 50 mm
Water Connection.....	½" male BSP
Generic Material.....	Porcelain

Operating Data

Flushing Time.....	5 seconds
Discharge Time.....	2 seconds
Water Pressure.....	2-7 bar
Operating Vacuum.....	Recommended 30-55 % Vacuum
Air Consumption.....	Approx. 48 liters at 50% Vacuum
Water Consumption.....	1 liter/s (3 bar)
Temperature Range.....	Minimum 1°C to Maximum 60°C (unless frost protection measures are taken)

Note:.....Values are dependent on product selection.

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Options

Optional functions compatible with this product.

VFD: Vacuum Flush and Discharge
 CFD: Central Flush and Discharge
 LFD: Local Flush and Discharge

Components

Construction Characteristics

- ① Toilet Bowl JETS Charm.....066607100*
- ② Flushing Nozzle Kit.....069503157*
- ③ Spring.....053531720*
- ④ Fastening Kit, wall.....069606400*
- ⑤ Seat & Cover.....See product selection
- ⑥ Valve.....See options listed above
- ⑦ Cap.....069606304*
- ⑧ Coaming.....037609312*
- ⑨ Release Mechanism.....See product selection

* Component/s available as replacement parts.

Accessories

Construction Characteristics

Vacuum Breaker Kit.....	034507320
Rubber Elbow w/hose clip.....	034505450
Rubber Sleeve w/hose clip.....	034505550
Rag Hook w/support.....	034102902
Bracket, retrofit toilet.....	069000300
Bracket, retrofit toilet.....	069000303
Fastening Kit, wall - Land.....	069606302
Pipe Packet.....	034399300

Jets Vacuum System
 Jets™ Charm Toilet (TO611PO)

Anhang 6

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway



Urinal Jets 720
 Product No. UR720SS

Tel. +47 70 03 91 00
 www.jetsgroup.com
 Issued | Rev



Jets™ 720 Urinal is a wall hung vacuum model urinal in a stainless steel design.

Warranty

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Technical Data

Outside Dimensions.....345 x 315 x 730 mm (LxWxH)
 Weight.....9 kg
 Discharge Valve Outlet.....Outside diameter Ø 50 mm
 Water Connection.....½" male BSP
 Generic Material.....AISI 304

Operating Data

Flushing Time.....5 seconds
 Discharge Time.....2 seconds
 Water Pressure.....2-7 bar
 Operating Vacuum.....Recommended 30-55 % Vacuum
 Air Consumption.....Approx. 48 liters at 50% Vacuum
 Water Consumption.....1 liter/s (3 bar)
 Temperature Range.....Maximum 1°C
 to Maximum 60°C
 (unless frost protection measures are taken)

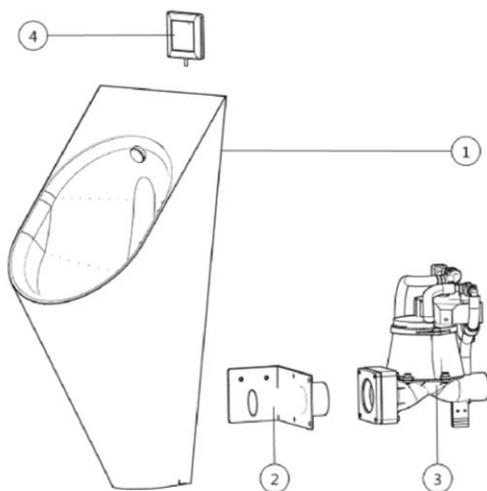
Note:.....Values are dependent on valve type.

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Options

Optional functions compatible with this product.

VFD: Vacuum Flush and Discharge
 EFD: Electrical Flush and Discharge
 CFD: Central Flush and Discharge

Components

Construction Characteristics

- ① Urinal Bowl JETS 720SS.....070700505*
- ② Bracket.....010100621*
- ③ Valve.....See options listed above
- ④ Release Button.....See product selection

* Component/s available as replacement parts.

Accessories

Construction Characteristics

- Rubber Elbow w/hose clip.....034505450
- Rubber Sleeve w/hose clip.....034505550
- Pipe Packet.....034399310

Jets Vacuum System
 Jets™ Urinal Jets 720 (UR720SS)

Anhang 7

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway

elektronische kopie der abz des dibt: z-53.6-492



Grey Water Interface Unit 12L

Product No. GWT800PL

Tel. +47 70 03 91 00
www.jetsgroup.com

Issued | Rev 2014-05-20 08:57:06



Jets™ Grey Water Interface Unit consists of a tank fitted with a level switch and a discharge valve. Grey water is led to the tank by gravity and interfaced with the vacuum system via the valve. The valve is activated by the water level inside the tank.

Warranty

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Technical Data

Tank Type.....	Interface Unit
Outside Dimensions.....	400 x 200 x 486 mm (LxWxH)
Weight.....	4.7 kg
Generic Material.....	PE
Color Range.....	White
Tank Volume.....	12 Litres
Discharge Volume.....	4 Litres at 30% Vacuum 4.5 Litres at 55% Vacuum
Discharge Valve Outlet.....	Outside diameter Ø 50 mm
Dimensions.....	A - 400 mm B - 200 mm C - 190 mm D - 486 mm E - Ø50 mm F - Ø50 mm G - 269 mm

Note:..... See dimensions drawing under installation.

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Options

Optional functions compatible with this product.

VD: Vacuum Discharge

Components

Construction Characteristics

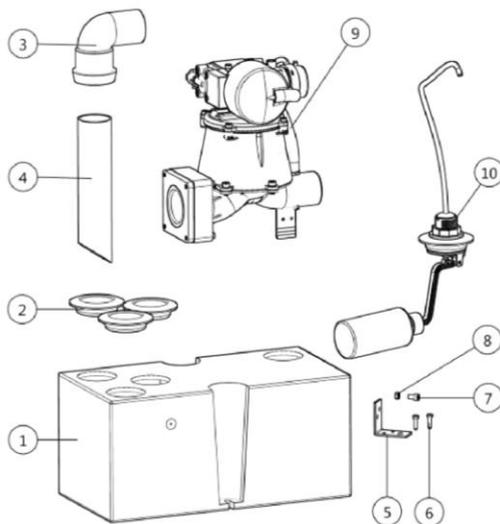
① Grey Water Tank 12L, plastic.....	080500026*
② Tank/Pipe Seal.....	034505310*
③ Pipe Bend, ø50mm 90dg.....	034512584*
④ Suction pipe.....	034512700*
⑤ Bracket.....	010100750*
⑥ Screw, M4x20.....	036515607*
⑦ Screw, M5x10.....	036531600*
⑧ Nut, M5.....	036304802*
⑨ Valve.....	See options listed above
⑩	Level Switch

* Component/s available as replacement parts.

Accessories

Construction Characteristics

Rubber Elbow w/hose clip.....	034505450
Rubber Sleeve w/hose clip.....	034505550
Air/Overflow Valve, Complete.....	035202511
Level Switch.....	032803900





Grey Water Interface Unit 12L

Product No. GWT800PL

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued | Rev 2014-05-20 08:57:06

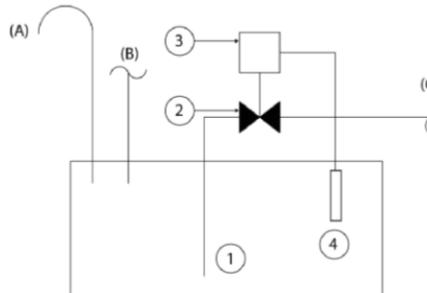
Function and Principle

- ① Suction Pipe
- ② Valve
- ③ Controller
- ④ Level Sensor

- (A) Air/Overflow
- (B) Inlet
- (C) Outlet

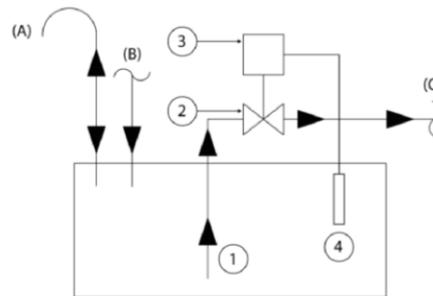
Normal Position: Closed Valve

- Valve ② - CLOSED
- Suction Pipe ① - EMPTY
- Controller ③ - DEACTIVATED
- Level Sensor ④ - DEACTIVATED



Emptying Sequence

1. Level Sensor ④ - ACTIVATES
2. Controller ③ - ACTIVATES
3. Valve ② - OPENS
4. Suction Pipe ① - FILLS
5. Outlet (C) - FLOWS



Closing Sequence

1. Level Sensor ④ - DEACTIVATES
2. Controller ③ - DEACTIVATES
3. Valve ② - CLOSES
4. Suction Pipe ① - EMPTIES
5. Outlet (C) - FLOW STOPS

Result: Grey water enters the tank until the determined level is reached.
 Grey water is sucked from the tank to the outlet.

Chemicals and Detergents

The following information is for Grey Water Interface Units which have washing machines, kitchen sinks, showers etc. connected to the vacuum pipelines.

Chemical detergents, when used excessively, may result in foaming in discharges.

Chlorine content in detergents may also have a negative effect on the process in any connected sewage treatment plant, as chlorine will kill the bacteria required in the process.



Grey Water Interface Unit 15L

Product No. GWT800SS

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued | Rev 2014-05-19 09:42:59



Jets™ Grey Water Interface Unit consists of a tank fitted with a level switch and a discharge valve. Grey water is led to the tank by gravity and interfaced with the vacuum system via the valve. The valve is activated by the water level inside the tank.

Warranty

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Technical Data

Tank Type.....	Interface Unit
Outside Dimensions.....	470 x 200 x 488 mm (LxWxH)
Weight.....	8.7 kg
Generic Material.....	AISI 316
Color Range.....	Metallic Grey
Tank Volume.....	15 Litres
Discharge Volume.....	5 Litres at 30% Vacuum 6 Litres at 55% Vacuum
Discharge Valve Outlet.....	Outside diameter Ø 50 mm
Dimensions.....	A - 470 mm B - 200 mm C - 190 mm D - 488 mm E - Ø50 mm F - Ø50 mm G - 271 mm

Note:..... See dimensions drawing under installation.

Patents and Trademarks

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Options

Optional functions compatible with this product.

VD: Vacuum Discharge

Components

Construction Characteristics

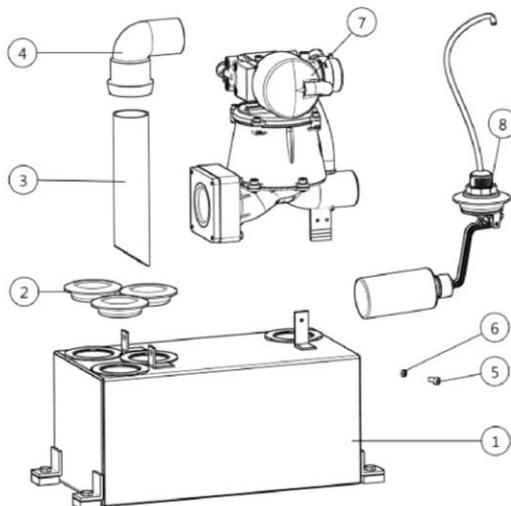
① Grey Water Tank 15L, ss.....	080812120*
② Tank/Pipe Seal.....	034505310*
③ Suction pipe.....	034512700*
④ Pipe Bend, ø50mm 90dg.....	034512584*
⑤ Screw, M5x10.....	036531600*
⑥ Nut, M5.....	036304802*
⑦ Valve.....	See options listed above
⑧	Level Switch

* Component/s available as replacement parts.

Accessories

Construction Characteristics

Rubber Elbow w/hose clip.....	034505450
Rubber Sleeve w/hose clip.....	034505550
Air/Overflow Valve, Complete.....	035202511
Level Switch.....	032803900
Pipe Clamp, 44-49mm.....	034319793
Screw, M8x16.....	036202500



Jets Vacuum System
 Grey Water Interface Unit 15L (GWT800SS)

Anhang 9-1

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway



Grey Water Interface Unit 15L

Product No. GWT800SS

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued | Rev 2014-05-19 09:42:59

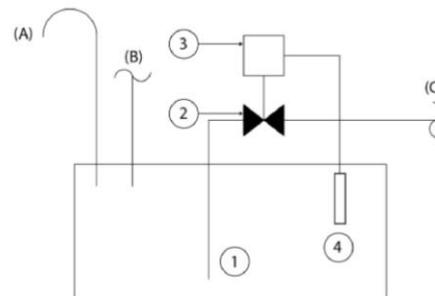
Function and Principle

- ① Suction Pipe
- ② Valve
- ③ Controller
- ④ Level Sensor

- (A) Air/Overflow
- (B) Inlet
- (C) Outlet

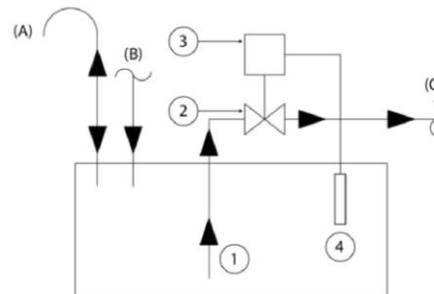
Normal Position: Closed Valve

- Valve ② - CLOSED
- Suction Pipe ① - EMPTY
- Controller ③ - DEACTIVATED
- Level Sensor ④ - DEACTIVATED



Emptying Sequence

1. Level Sensor ④ - ACTIVATES
2. Controller ③ - ACTIVATES
3. Valve ② - OPENS
4. Suction Pipe ① - FILLS
5. Outlet (C) - FLOWS



Closing Sequence

1. Level Sensor ④ - DEACTIVATES
2. Controller ③ - DEACTIVATES
3. Valve ② - CLOSES
4. Suction Pipe ① - EMPTIES
5. Outlet (C) - FLOW STOPS

Result: Grey water enters the tank until the determined level is reached.
 Grey water is sucked from the tank to the outlet.

Chemicals and Detergents

The following information is for Grey Water Interface Units which have washing machines, kitchen sinks, showers etc. connected to the vacuum pipelines.

Chemical detergents, when used excessively, may result in foaming in discharges.

Chlorine content in detergents may also have a negative effect on the process in any connected sewage treatment plant, as chlorine will kill the bacteria required in the process.



D Valve

Product No. 050513000

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued 2013-08-26 | Rev 2.0



Jets™ D Valve effectively controls discharge flow in a range of pneumatically operated vacuum discharge valves.

Warranty

All products of the company are sold and all services of the company are offered subject to Jets Vacuum AS General Sales Conditions detailing warranty and terms and conditions of sale, copies of which will be furnished upon request. The information provided herein is for guidance only; it does not constitute a guarantee of the performance or specification of any individual product or component.

Technical Data

Type Vacuum Operated
 Outside Dimensions..... 235mm x 170mm x 215mm (LxWxH)
 Weight..... 0.8 kg
 Generic Material..... PP
 Discharge Valve Inlet..... Inside diameter Ø 60 mm
 Discharge Valve Outlet..... Outside diameter Ø 50 mm

Operating Data

Temperature Range..... Minimum 0°C
 to Maximum 60°C
 (unless frost protection measures are taken)

Patents and Trademarks

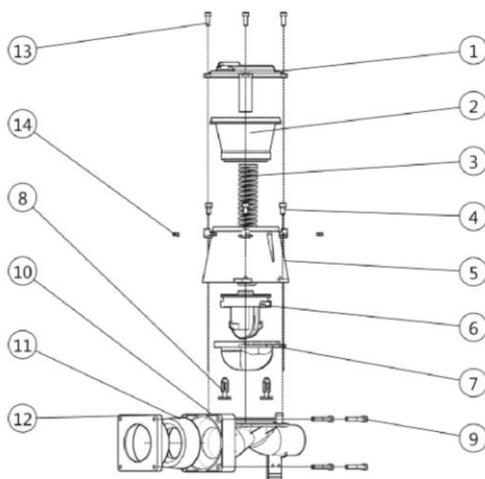
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Components

Construction Characteristics



①	Top Housing TH2.....	054110012*
②	Lifting Membrane.....	050500800*
③	Spring.....	050500700*
④	Screw, M6x12.....	036500100*
⑤	Center Housing CH2.....	051511601*
⑥	Membrane Guide.....	051501000*
⑦	Shut-off Membrane.....	050501200*
⑧	Membrane Lifter.....	051501100*
⑨	Screw, M5x40.....	036531800*
⑩	Lower Housing.....	054110020*
⑪	Seal.....	037531100*
⑫	Flange.....	053531200*
⑬	Screw, M5x16.....	036531700*
⑭	Nut, M5.....	036304802*

* Component/s available as replacement parts.

Jets Vacuum System
 D Valve (050513000)

Anhang 10

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway

JETS VPC-V Controller
 Product No. 101100010

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued 2013-08-26 | Rev 1.0



Jets™ VPC-V Controller is designed to control water consumption, flushing and discharge cycles for a valve.

Warranty

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Technical Data

Outside Dimensions.....165 x 100 x 150 mm (LxWxH)
 Weight.....0.7 kg
 Generic Material.....POM
 Water Connection.....1/2" male BSP

Operating Data

Operating Vacuum.....Recommended 30-55 % Vacuum
 Water Pressure.....2-7 bar

Patents and Trademarks

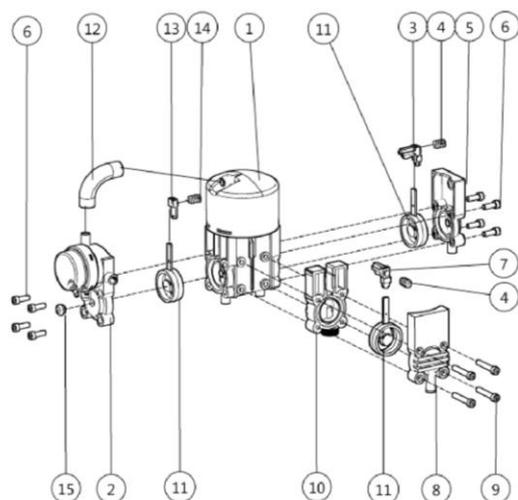
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Components

Construction Characteristics



- ① Valve Housing w/Cylinder.....101101520*
- ② Start Valve.....101101810*
- ③ Yoke.....101100500*
- ④ Spring.....101100600*
- ⑤ Control Valve Top.....101100700*
- ⑥ Screw, M5x16.....036531700*
- ⑦ Yoke.....101100550*
- ⑧ Water Valve Top.....101101700*
- ⑨ Screw, M5x35.....036531801*
- ⑩ Water Valve Bottom.....101101600*
- ⑪ Sealing Flap.....101101000*
- ⑫ Hose.....034509000*
- ⑬ Spring Guide.....101100800*
- ⑭ Spring.....101100900*
- ⑮ Orifice set.....037506420*

* Component/s available as replacement parts.

Jets Vacuum System
 VPC-V Controller (101100010)

Anhang 11-1

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway

elektronische kopie der abz des dibt: z-53.6-492



Valve Housing w/Cylinder

Product No. 101101520

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued | Rev 2014-06-09 22:36:27



Technical Data

Outside Dimensions.....161 x 88 x 88 mm (LxWxH)
 Weight.....0.375 kg
 Generic Material.....POM

Patents and Trademarks

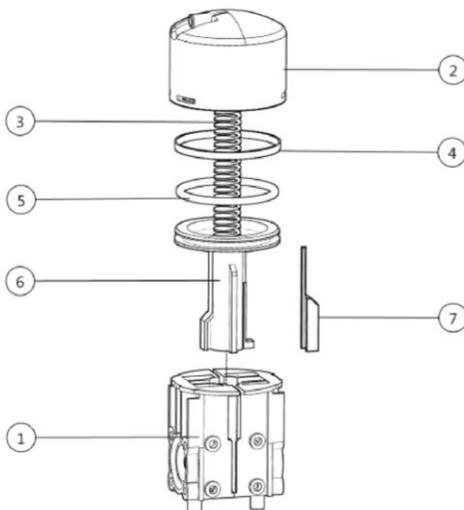
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Components

Construction Characteristics

①	Valve Housing.....	101101500
②	Cylinder.....	101100105
③	Spring.....	101100200
④	Piston Ring.....	037201200
⑤	O-ring.....	037532100
⑥	Piston.....	101100300
⑦	Cam C2.....	101100402

Only available for sale as a complete item.



Start Valve

Product No. 101101810

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued | Rev 2014-06-09 22:38:33



Technical Data

Outside Dimensions.....112 x 59 x 54 mm (LxWxH)
 Weight.....0.105 kg
 Generic Material.....POM

Patents and Trademarks

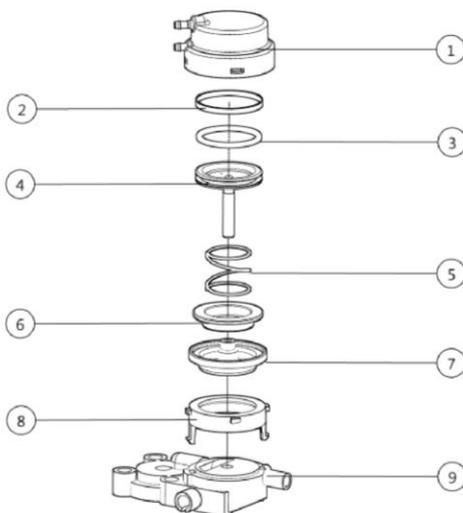
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Components

Construction Characteristics

①	Start Cylinder.....	101101111
②	Piston Ring.....	037201100
③	O-ring.....	037532200
④	Start Piston.....	101101211
⑤	Spring.....	101101301
⑥	Membrane Support.....	101101280
⑦	Membrane.....	037305301
⑧	Main Fastener.....	101101401
⑨	Start Valve Top.....	101101400

Only available for sale as a complete item.

Jets Vacuum System
 Start Valve (101101810)

Anhang 11-3

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway



Release Button

Product No. 100100030

Tel. +47 70 03 91 00
www.jetsgroup.com

Issued 2014-02-01 | Rev 1.0



Technical Data

Type.....Vacuum Operated
Outside Dimensions.....47 x 47 x 66 mm (LxWxH)
Weight.....0.08 kg
Generic Material.....ABS
Drill Diameter.....Ø 35 mm

Patents and Trademarks

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A quality sanitary fitting with an in built release mechanism that supports Jets™ vacuum systems.

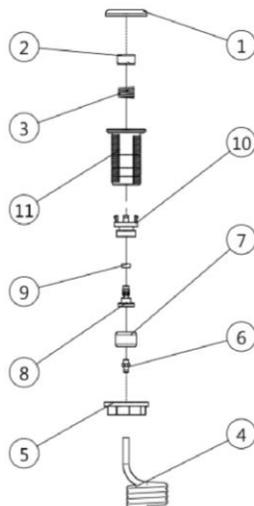
The vacuum operated release button punctures vacuum to activate the flush cycle.

Features

- Reliable discharge activation.
- Suitable for demanding applications.

Warranty

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Components

Construction Characteristics

①	Cover.....	100100104
②	Push Button.....	100100204
③	Spring.....	100100601
④	Hose, 1200mm.....	034501020*
⑤	Nut.....	100100455
⑥	Nipple.....	034505610
⑦	Membrane.....	037305300
⑧	Valve Body.....	100100450
⑨	O-ring.....	037201301
⑩	Valve Housing.....	100100402
⑪	Housing, threaded.....	100100405

* Component/s available as replacement parts.



Release Button, chromium plated

Product No. 100100035

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued | Rev 2015-07-13 10:55:17



Technical Data

Type.....Vacuum Operated
 Outside Dimensions.....47 x 47 x 66 mm (LxWxH)
 Weight.....0.08 kg
 Generic Material.....ABS
 Drill Diameter.....Ø 35 mm

Patents and Trademarks

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A quality sanitary fitting with an in built release mechanism that supports Jets™ vacuum systems.

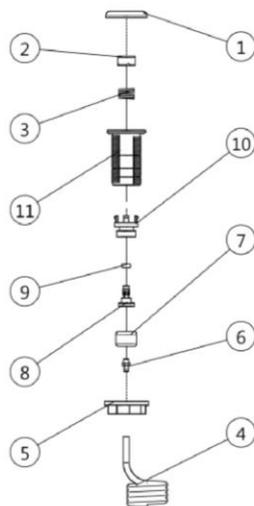
The vacuum operated release button punctures vacuum to activate the flush cycle.

Features

- Reliable discharge activation.
- Suitable for demanding applications.

Warranty

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Components

Construction Characteristics

①	Cover, chromium plated.....	100100105
②	Push Button, chromium plated.....	100100205
③	Spring.....	100100601
④	Hose, 1200mm.....	034501020
⑤	Nut.....	100100455
⑥	Nipple.....	034505610
⑦	Membrane.....	037305300
⑧	Valve Body.....	100100450
⑨	O-ring.....	037201301
⑩	Valve Housing.....	100100402
⑪	Housing, threaded.....	100100405

Only available for sale as a complete item.

Jets Vacuum System
 Release Button, chromium plated (100100035)

Anhang 13

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway

elektronische kopie der abz des dibt: z-53.6-492



Vacuum Breaker Kit

Product No. 034507320

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued 2013-08-21 | Rev 3.0



The Vacuum Breaker Kit is a device installed to prevent back flow (siphoning effect) of contaminated water from a toilet into the fresh water supply system.

Warranty

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Technical Data

Weight.....0.72 kg
 Generic Material.....Brass
 Coating.....Nickel Plated
 Connection Diameter.....Ø 10 mm

Operating Data

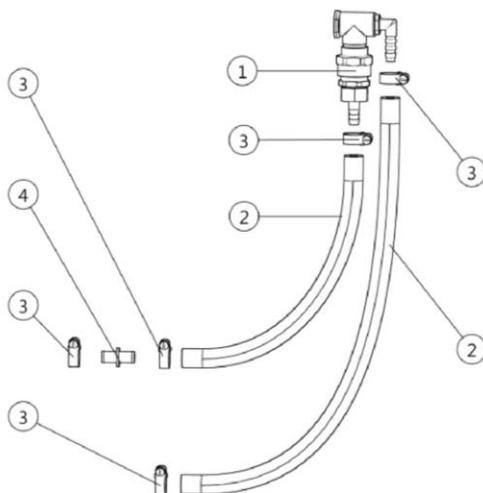
Minimum Working Temperature.....1°C
 Water Supply.....Freshwater

Patents and Trademarks

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Components

Construction Characteristics

- ① Vacuum Breaker.....034507310
- ② Hose.....034509000
- ③ Hose Clip 13-20mm.....034233401
- ④ Coupling.....034502602

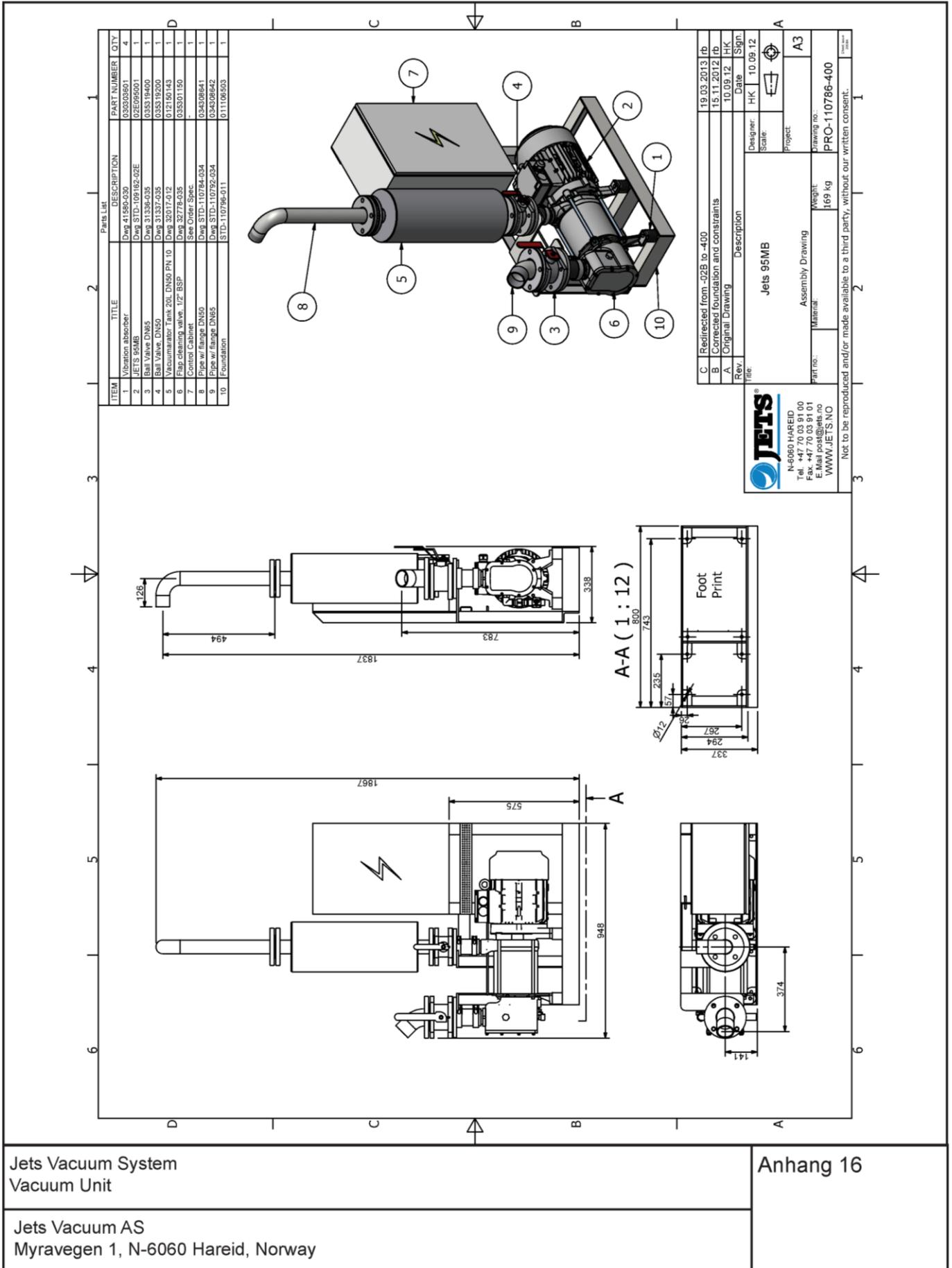
Only available for sale as a complete item.

Jets Vacuum System
 Vacuum Breaker Kit (034507320)

Anhang 14

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway

elektronische kopie der abz des dibt: z-53.6-492



Jets Vacuum System
 Vacuum Unit

Anhang 16

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway



Jets™ 95MB Vacuumator™ Pump

Product No. 02E095001

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued 2014-01-17 | Rev 1.0



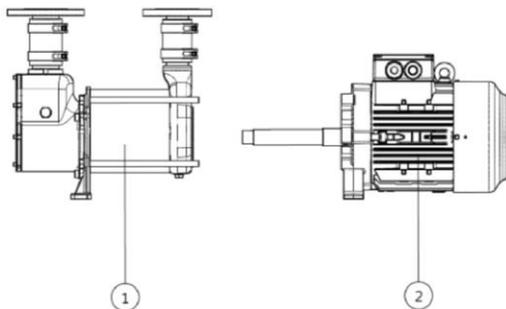
Vacuumator™ pumps are the most compact, efficient and reliable vacuum generators available for vacuum sanitary systems. The pump creates vacuum, macerates sewage and discharges in one single-pass operation.

Features:

- Highly efficient in transporting any combination of black and grey water under vacuum.
- Small footprint and low weight allows unique installation flexibility.
- In line installation – direct discharge to sewer, STP (Sewage Treatment Plant) or collecting tank.
- High vacuum generating capacity.
- Multiphase design pumps any combination of air and black/grey water.
- Low energy consumption.
- High quality – low life cycle cost.

Warranty

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Technical Data



Pump Type.....	Multiphase
Capacity.....	61 m ³ /h ACMH at 500 mbar abs. (50% vacuum) 50 Hz 91 m ³ /h ACMH at 500 mbar abs. (50% vacuum) 60 Hz
Flushing Capacity.....	730 flushes/hour 50Hz 800 flushes/hour 60Hz
Outside Dimensions.....	820mm x 267mm x 335mm (LxWxH)
Weight.....	97.4 kg
Generic Material.....	Stainless Steel
Connection Inlet.....	DN65, PN10
Connection Outlet.....	DN50, PN10
Protection Class.....	IP 55
Insulation Class.....	F
Duty.....	S1-100%
Ambient Temperature.....	45 °C
Ambient Temperature Range.....	Min +20 °C - Max +45 °C
Humidity.....	Class F / 95%
Conformity.....	Efficiency class IE1 in accordance with exceptions given in IEC60034-30

Operating Data

Frequency.....	50 // 60 Hz
Voltage.....	Y380/Δ220 // Y440/Δ255 V
Nominal Current.....	11.4/19.6 // 12/19.3 A
Speed.....	C-CW 2895 // 3495 rpm
Power Output.....	5.5 // 6.3 kW
Power Factor.....	0.9 // 0.89 cos φ
Efficiency.....	82 // 83%

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Components

Construction Characteristics

- ① Vacuumator 95MB.....02E095050
* Not available complete. Components available individually.
- ② Motor, 220/380-50 255/440-60.....031226200*
* 50 // 60 Hz = Y380/Δ220 // Y440/Δ255 V

* Component/s available as replacement parts.

Jets Vacuum System
 Jets™ 95MB Vacuumator™ Pump (02E095001)

Anhang 17-1

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway

elektronische kopie der abz des dibt: z-53.6-492



Vacuuarator 95MB

Product No. 02E095050

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued 2014-01-17 | Rev 1.0



Technical Data



Outside Dimensions.....	436 x 267 x 448 mm (LxWxH)
Weight.....	40.4 kg
Generic Material.....	Stainless Steel
Connection Inlet.....	DN65, PN10
Connection Outlet.....	DN50, PN10
Connection Return Water.....	BSP female 1/2"

Note:

- * NOT AVAILABLE AS A COMPLETE ITEM.
- * COMPONENTS AVAILABLE INDIVIDUALLY AS LISTED.

Jets™ Vacuuarator™ pump is designed for integration with an industrial standard motor from Jets™ electric motor range. The purpose of the Vacuuarator™ is to pump and macerate effluent and other liquids.

Patents and Trademarks

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Jets Vacuum System
 Vacuuarator™ 95MB (02E095050)

Anhang 17-2

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway

elektronische kopie der abz des dibt: z-53.6-492

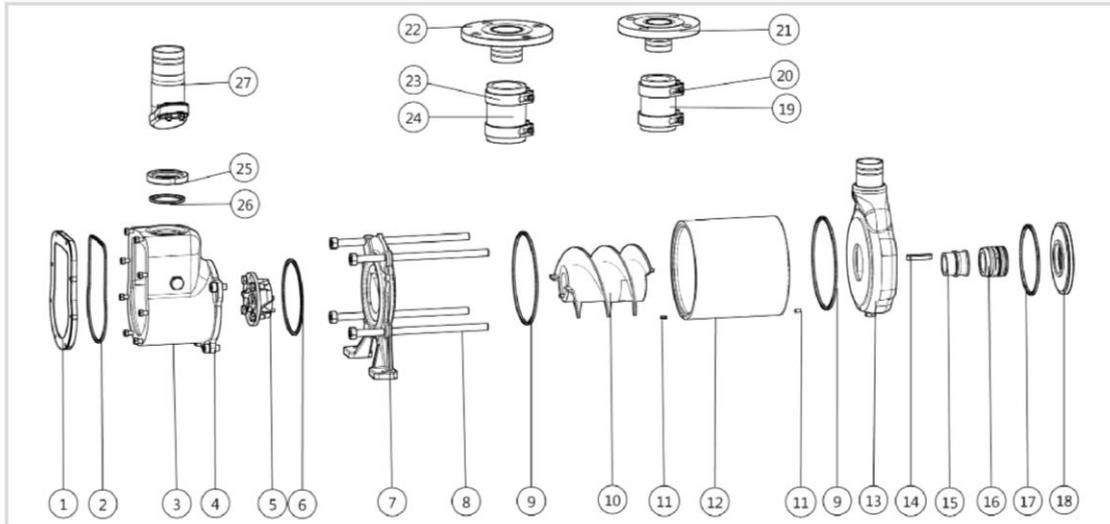


Vacuuarator 95MB

Product No. 02E095050

Tel. +47 70 03 91 00
www.jetsgroup.com

Issued 2014-01-17 | Rev 1.0



Components

Construction Characteristics

①	Cover.....	023280050*
②	O-ring.....	037219260*
③	Suction Chamber, Complete.....	023280041*
④	Screw, M10x20.....	036207621*
⑤	Macerator.....	02E095054*
⑥	O-ring.....	037219220*
⑦	End Flange.....	02E095056*
⑧	Screw, M12x270.....	036202013*
⑨	O-ring.....	037219261*
⑩	Rotor.....	02E095057*
⑪	Split Sleeve.....	020207801*
⑫	Rotor Housing.....	02E095058*
⑬	Pressure Chamber, Complete.....	02E095063*
⑭	Key.....	02A265113*
⑮	Spacer Sleeve.....	02E095060*
⑯	N/A

⑰	O-ring.....	037219270*
⑱	Flange for Shaft Seal.....	02A265108*
⑲	Hose, compensator Ø50.....	034507502*
⑳	Hose Clip 64-70mm.....	034507420*
㉑	Flange w/connecting pipe DN50.....	029152100*
㉒	Flange w/connecting pipe DN65.....	02E095055*
㉓	Hose Clip 74-80mm.....	034506906*
㉔	Hose, compensator Ø60.....	034507503*
㉕	Nut for flap valve.....	02E095051*
㉖	O-ring.....	037219280*
㉗	Flap Valve, Complete.....	02E095061*

* Component/s available as replacement parts.



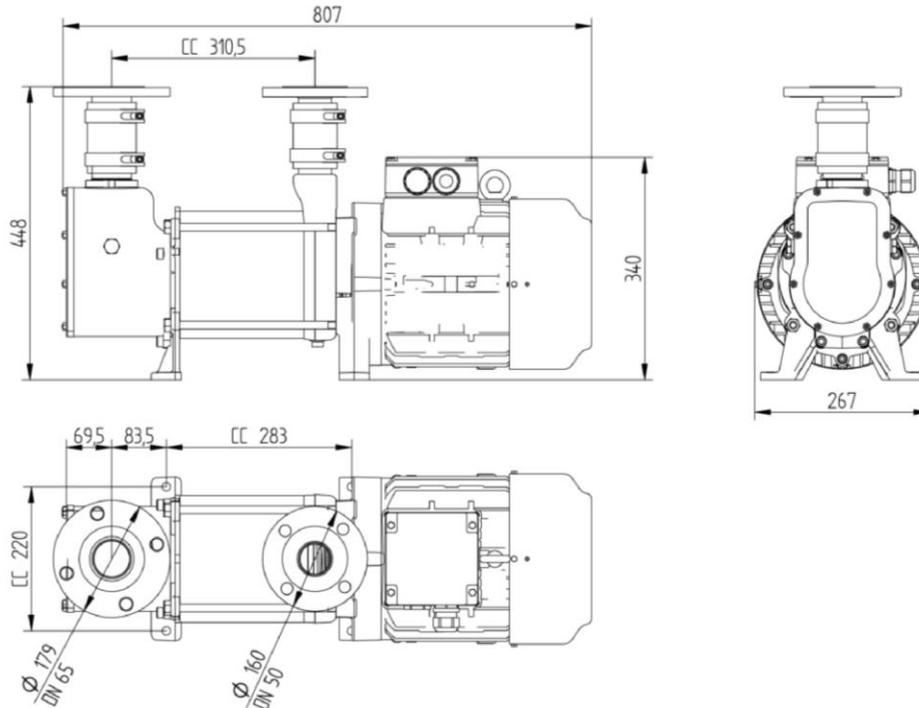
Jets™ 95MB Vacuumator™ Pump

Product No. 02E095001

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued 2014-01-17 | Rev 1.0

Technical Dimensions



Mode of Operation

A Vacuumator™ pump is a helical screw pump with an integrated macerator.

Designed as a mono-block pump, the Vacuumator™ consists of a helical screw/impeller centrally located in a cylindrical rotor housing with two end plates. A macerator, located in front of the impeller, consists of one rotating part and one stationary part. The rotating part is connected to the end of the shaft. Ball bearings inside the electric motor support the shaft on the drive side. In operation, the liquid (consisting of black water or grey water or a combination), forms a seal between the impeller and the cylindrical housing. Transport of air and water takes place in cavities created by this seal, traveling from the suction to the pressure side of the rotor housing.

Design Advantages

Vacuumator™ pumps are specially designed for use in vacuum sanitary systems. The pumps are also used for any kind of liquid transportation. Manufactured to the highest standards this unique technology gives a highly reliable pump with few moving components and large tolerances between rotating parts.

A highly efficient vacuum generator, this pump can transport any combination of air, sewage and liquid.

Small footprint, and in-line design allows for easy and a highly flexible installation configurations.

Renowned for lasting quality and low life cycle cost, Vacuumator™ pumps come with a solid track record spanning decades, from all types of vacuum sanitary systems and land and marine applications worldwide.

Multiphase pumps can accommodate all fluid stream properties up to 100 percent liquid and air, and all combinations in between. The flow stream can also contain abrasives such as dirt or particles. The multiphase pump is designed to operate under changing/fluctuating process conditions, changing process fluid composition, temperature variations, high and low operating pressures and exposure to abrasive/erosive media. Multiphase pumping also helps eliminate emissions of greenhouse gases.

Jets Vacuum System
 Jets™ 95MB Vacuumator™ Pump (02E095001)

Anhang 17-4

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway



Jets™ 95MB Vacuumator™ Pump

Product No. 02E095001

Tel. +47 70 03 91 00
 www.jetsgroup.com

Issued 2014-01-17 | Rev 1.0

The monoblock design with motor, screw and macerator on the same shaft provides a safe and simple construction and with few moving parts, ensures operational stability. In-line design allows easy installation and a flexible pipe layout. Sewage is collected, macerated and discharged in a single-pass operation. No recirculation means no foaming and lower energy consumption. Continuous flow instead of recirculation enhances any downstream treatment process. The temperature of the sewage stays low, providing better treatment efficiency. The Vacuumator™ pump is a highly self-contained unit independent of a separate water supply.

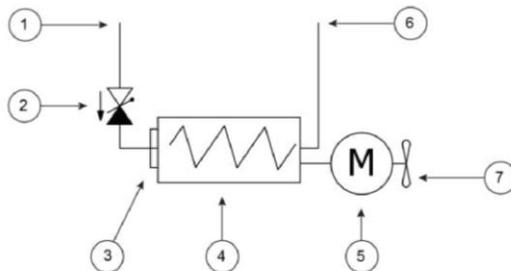
Precision engineering ensures perfect fit of all pump components. The result is a pump that works effectively with a lengthy life span.

Function and Principle - Jets™ 95MBA Vacuumator™

Explanation of the 95MB Vacuumator™ Function

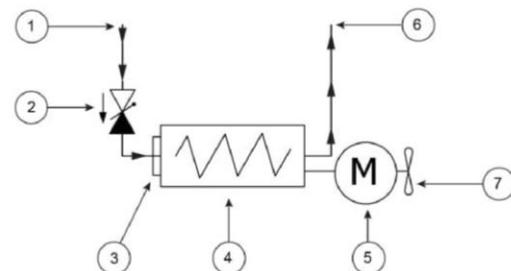
- ① Inlet
- ② Flap Valve
- ③ Macerator
- ④ Helical Screw

- ⑤ Motor
- ⑥ Outlet
- ⑦ Fan



Normal Position - Pump Inactive

- Motor ⑤ - INACTIVE
- Fan ⑦ - INACTIVE
- Helical Screw ④ - INACTIVE
- Macerator ③ - INACTIVE
- Flap Valve ② - CLOSED



Running Conditions - Activated Sequence

1. Motor ⑤ - ACTIVATED
- Fan ⑦ - ACTIVATED
2. Helical Screw ④ - ACTIVATED
- Macerator ③ - ACTIVATED
3. Inlet ① - FLOWS
4. Flap Valve ② - OPENS
5. Outlet ⑥ - FLOWS

Running Conditions - Deactivation Sequence

1. Motor ⑤ - DEACTIVATED
- Fan ⑦ - DEACTIVATED
2. Helical Screw ④ - DEACTIVATED
- Macerator ③ - DEACTIVATED
3. Flap Valve ② - CLOSES
4. Inlet ① - FLOW STOPS
- Outlet ⑥ - FLOW STOPS

Description

Flap Valve: Facilitates flow into the pump, seals vacuum in the pipes and prevents backflow.

Macerator: The macerator grinds waste to a fine pulp.

Helical Screw: The helical screw uses liquid to create a seal facilitating vacuum in the pump housing.



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Shaft: The shaft is the connecting factor between the macerator, helical screw and motor. It supports and rotates the helical screw and macerator.

Motor: Supplies power to support pump function.

Inlet: Flow inlet from the source into the pump.

Outlet: Flow outlet from the pump to the pipe connection/discharge.

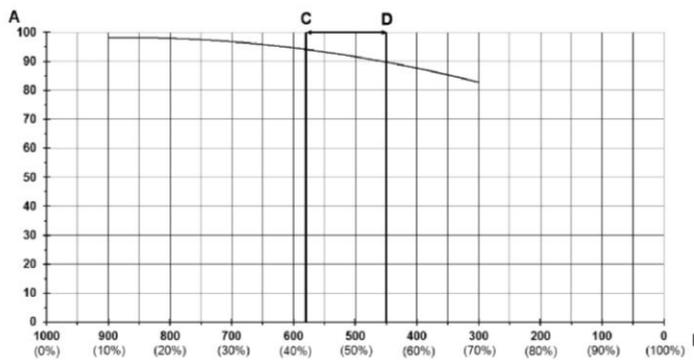
Fan: The fan provides cooling for the motor.

Capacity and Power Consumption Curves

Capacity curves represent performance under ideal conditions. The test method is modelled on the standard throughput method, as described in ISO21360-1.

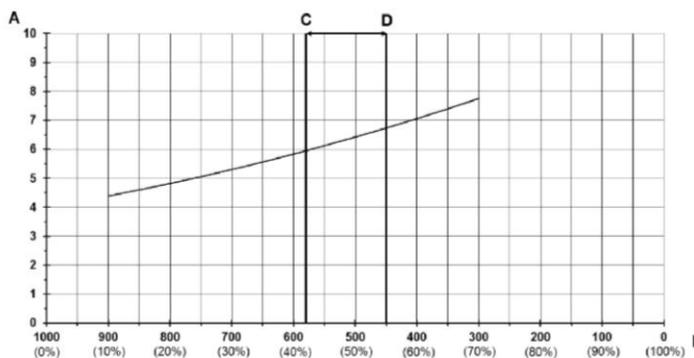
For further information and test parameters, please refer to the Standard Performance Test.

Capacity 60 Hz



- (A) Vertical axis [m³/h]
Actual cubic meters per hour
- (B) Horizontal axis [mbar]
Absolute pressure
(Relative % below atmospheric pressure)
- (C) - (D) Interval
Normal workload

Power Consumption 60 Hz



- (A) Vertical axis [kW]
Power consumption
- (B) Horizontal axis [mbar]
Absolute pressure
(Relative % below atmospheric pressure)
- (C) - (D) Interval
Normal workload

Jets Vacuum System
 Jets™ 95MB Vacuumator™ Pump (02E095001)

Anhang 17-6

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway

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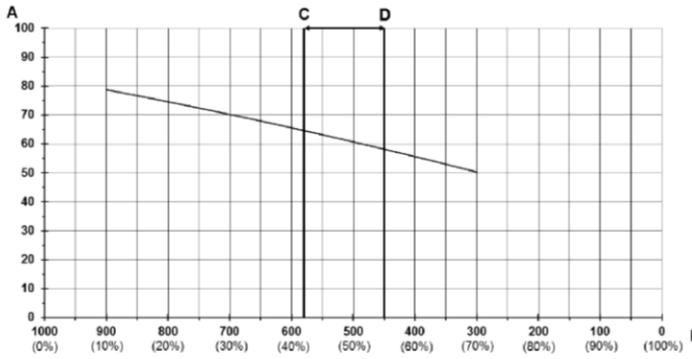
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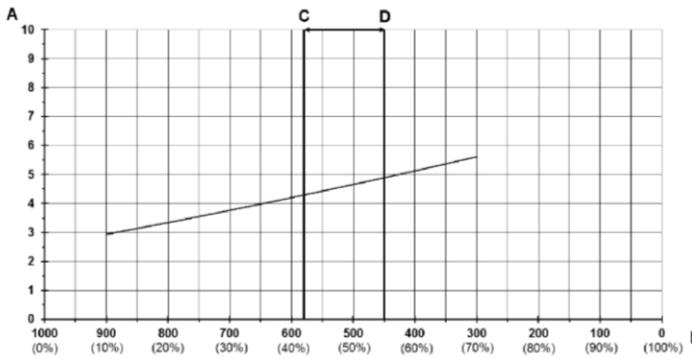
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Capacity 50 Hz



- (A) Vertical axis [m³/h]
Actual cubic meters per hour
- (B) Horizontal axis [mbar]
Absolute pressure
(Relative % below atmospheric pressure)
- (C) - (D) Interval
Normal workload

Power Consumption 50 Hz



- (A) Vertical axis [kW]
Power consumption
- (B) Horizontal axis [mbar]
Absolute pressure
(Relative % below atmospheric pressure)
- (C) - (D) Interval
Normal workload

Jets Vacuum System
 Jets™ 95MB Vacuumator™ Pump (02E095001)

Anhang 17-7

Jets Vacuum AS
 Myravegen 1, N-6060 Hareid, Norway



Motor, 220/380-50 255/440-60
 Product No. 031226200

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The precision engineered industrial motor is designed to provide optimal performance and reliability over an extended lifetime.

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Technical Data

Mark.....	M30
Protection Class.....	IP 55
Insulation Class.....	F
Duty.....	S1-100%
Ambient Temperature.....	45 °C
Weight.....	57 kg
Generic Material.....	Cast Iron
Conformity.....	CE NEN/ISO 2373-1974 class "N"
Marine Classification.....	According to DNV
Ambient Temperature Range.....	Min +20 °C - Max +45 °C
Humidity.....	Class F / 95%
Dimensions.....	A - 624 mm B - 267 mm C - 340 mm

Operating Data

Frequency.....	50 // 60 Hz
Power Output.....	5.5 // 6.3 kW
Speed.....	C-CW 2895 // 3495 rpm
Voltage.....	Y380/Δ220 // Y440/Δ255 V
Nominal Current.....	11.4/19.6 // 12/19.3 A
Power Factor.....	0.9 // 0.89 cos φ
Efficiency.....	82 // 83%
Starting Torque d.o.l.....	180 // 190 %
Starting Current d.o.l.....	610 // 620 %
No Load Current.....	3.99/3.99 // 3.61/3.61 A
Temp. Rise Windings.....	82.8 // 75.7 K
Temp. Rise Surface.....	30.9 // 25.4 K

Jets Vacuum System
 Motor, 220/380-50 255/440-60 (031226200)

Anhang 18-1

Jets Vacuum AS
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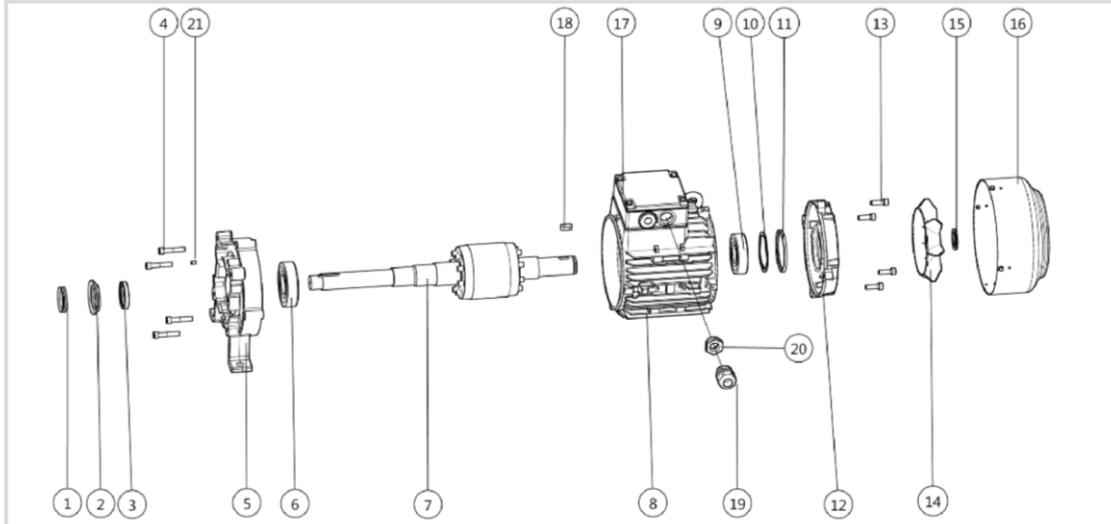


Motor, 220/380-50 255/440-60

Product No. 031226200

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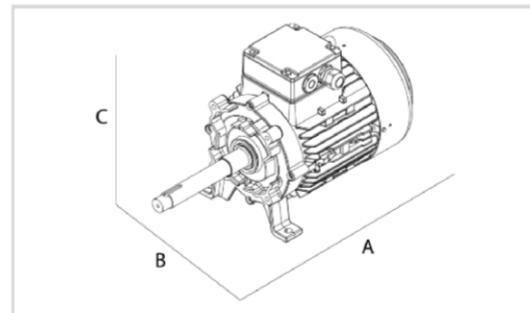


Components

Construction Characteristics

- ① V-ring.....038399550*
- ② Drip Flange.....02A265116*
- ③ Sealing Ring.....037224200*
- ④ Screw, M8x50.....036503411*
- ⑤ Motorflange.....02A265103*
- ⑥ Ball Bearing.....038223800*
- ⑦ Shaft with Rotor.....02A265107*
- ⑧ Stator, 220/380-50 255/440-60.....031225103*
= 50 // 60 Hz = Y380/Δ220 // Y440/Δ255 V
- ⑨ Ball Bearing.....038226000*
- ⑩ Spacer Sleeve.....031226900*
- ⑪ O-ring.....037201600*
- ⑫ End Cover.....031225131*
- ⑬ Screw, M8x30.....036202200*
- ⑭ Fan.....031225120*
- ⑮ Circlip.....037227100*
- ⑯ Fan cover.....031225110*
- ⑰ Terminal Box.....031225700*
- ⑱ Key.....022222150*
- ⑲ Plug.....034232959*
- ⑳ Nipple.....034315619*
- ㉑ Split Sleeve.....020207801*

* Component/s available as replacement parts.



Jets Vacuum System
 Motor, 220/380-50 255/440-60 (031226200)

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Anhang 18-2

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Vacuum Breaker

Product No. 034507310

Tel. +47 70 03 91 00
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Technical Data

Outside Dimensions.....113 x 53 x 60 mm (LxWxH)
 Weight.....0.34 kg
 Generic Material.....Brass
 Coating.....Nickel Plated

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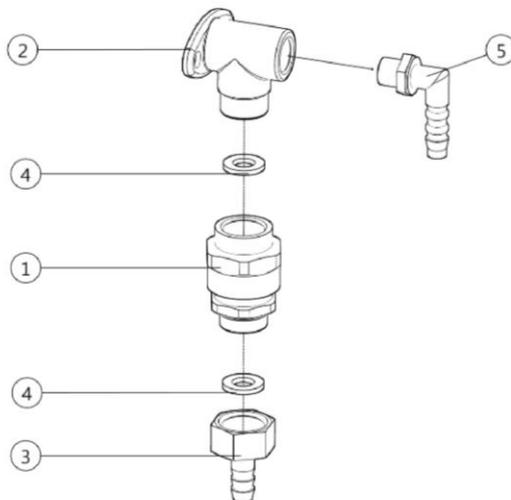
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Components

Construction Characteristics

- ① Vacuum Valve.....035506400
- ② Elbow.....034506601
- ③ Hose Nipple 10-1/2".....034233710
- ④ Sealing Ring.....037504201
- ⑤ Nipple.....034501510

Only available for sale as a complete item.

Jets Vacuum System
 Vacuum Breaker (034507310)

Anhang 19

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