

ATEX

Equipment for environments
with potentially explosive dust

Healthy Business

Dustcontrol 





We comply with the ATEX directives

ATEX

The terms “ATEX classification”, “ATEX zones” and “Dust classification” come from the ATEX Directives. ATEX is an abbreviation for the french term “ATmosphères EXplosible” and refers to atmospheres that are potentially explosive.

The directives apply to manufacturers of equipment to be installed in potentially explosive areas (Product Directive 2014/34/EU) and to ensure the safety of the working environment for personnel in the potentially explosive atmosphere (OSH Directive 1999/92/EU). Within the EU, all equipment intended for use in an area where an explosive atmosphere may occur shall comply with the requirements of the Product Directive. The combination of explosive environment and ignition sources such as electrical, mechanical, friction, light, sound, heat has always entailed great risks.



www.dustcontrol.us



Explosive atmospheres arise when sufficient (LEL, Lower Explosion Limit/MEC, Minimum Explosible Concentration) combustible dust distributed in the air (oxygen) in an enclosure is combined with a ignition source. Many common substances present in industrial processes are explosive/combustible if they are or becomes atomized into small particles. Examples of substances are coal, flour, cereals, wood, cotton and plastics.

Metal particles from aluminium, titanium and magnesium are especially dangerous as they are not only incinerated in the event of an explosion or fire, they can also react with moisture and thus release hydrogen which has a very low ignition energy (MIE, Minimum Ignition Energy).

With a central vacuum system from Dustcontrol, the collection of dust are prevented by regular cleaning of the premises. The central dust extractor remove the dust, smoke, shavings, and other particles at the source, minimizing the risk of a dust explosion.

Our mobile EX-line range features light, flexible equipment suitable for general cleaning in locations where highly portable or movable units are required.



The dangers of powders and how to avoid dust explosions

Powders

Powders of almost any kind can form a combustible mixture when dispersed at a sufficient concentration in the air. This makes the explosion protection system critical. The powder to be produced should be tested to determine the deflagration characteristics as the first step to designing the explosion protection system. All products should be tested for the following characteristics as these will form the basis of the explosion protection system.

In general, reducing (fractioning of the sucked material) the particle size of powders leads to an increased Dust Deflagration Index (K_{st}), increased Maximum Pressure generated (P_{max}), and increased Maximum Rate of Pressure Increase (dP/dt_{max}) while also decreasing the Minimum Explosible Concentration (MEC), decreasing the Minimum Ignition Energy (MIE), and possibly decreasing the Auto-Ignition Temperature (AIT) – the lowest temperature at which the material spontaneously ignites in normal atmosphere without an external source of ignition, such as a heat, flame or spark.

Powders are grouped into one of three hazard classes based on the K_{st} value of the material. Class St-1 materials are those materials with a K_{st} of less than 200. These materials produce the lowest rates of pressure increase and have the potential for the least structural damage. Class St-2 materials are those materials with a K_{st} of between 200 and 300 and have medium high rates of pressure increase. Class St-3 materials have K_{st} values of more than 300 and have very high rates of pressure increase. It is important to keep in mind that materials with a low K_{st} can have a very high P_{max} – meaning that the pressure wave can propagate slowly but produce pressures much greater than a material with a higher K_{st} but a lower P_{max} value.

Explanation of words

P_{max} – Maximum pressure produced during deflagration.

dP/dt_{max} – Maximum Rate of Pressure Increase. Maximum rate of pressure rise produced during the deflagration. Value of dP/dt can be used with the vessel volume to determine the value of deflagration index (K_{st}).

K_{st} – Dust Deflagration Index. Maximum rate of pressure increase, normalized to the volume in which the rate was measured. Used to measure relative explosive severity compared to other dusts.

Minimum Explosible Concentration (MEC) – Minimum amount of dust, dispersed in air, required to support a deflagration.

Minimum Ignition Energy (MIE) – Minimum energy required to ignite. Lowest capacitive spark energy capable of igniting the most ignition-sensitive concentration of a combustible duct-air mixture.

Limited Oxygen (Oxidant) Concentration (LOC) – The least amount of oxygen required for explosion propagation through the dust cloud.

Electrostatic Charging Tendency (ECT) – Predicts the probability of a material to develop and discharge, sufficient static electricity to ignite a dispersed dust cloud.

P_{red} – Reduced pressure developed by an explosion event after interception by the explosion protection system.

Pre-conditions for a dust explosion

Ignition source

To ignite the dust, energy is needed. It can come from a small source of static electricity, a larger energy source such as an open flame, electrical faults, or heating if enough dust accumulates on a warm surface.

Combustible material

The size of the particles is of great importance, smaller particles are more flammable and easier to disperse in the air. The concentration of dust is also of great importance and must be within a given range for an explosion to occur.

Oxygen

Combustion requires oxygen, normally the oxygen content in air is sufficient to create an explosive environment.

Mix

The dust must be airborne. Even dust that is not normally airborne can become so in connection with another explosion or external influence.

Containment

If the explosion occurs in a containment, this can result in a rapid increase in pressure.





Risk assessment



The consequences of a dust explosion can be devastating in terms of both material and personal. In the OSH directive 1999/92EU, the employer is ultimately responsible for ensuring that the production facility is built safely, that the staff is trained and must, in accordance with the mandatory regulations, have drawn up a so-called explosion protection document. It shall contain risk analyzes, classification plans, a list of flammable liquids, gases and dust as well as routines for safe handling in the event of an explosive atmosphere.

Depending on the frequency and duration of an explosive atmosphere, the risk area is divided into zones:

Zone 20

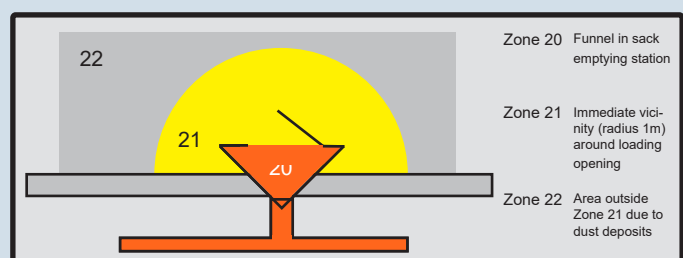
Location where an explosive atmosphere in the form of a cloud in combustible dust in the air occurs for extended periods of time, often recurring or continuously.

Zone 21

Location where explosive atmosphere in the form of a cloud of combustible dust can sometimes form in the air during operation.

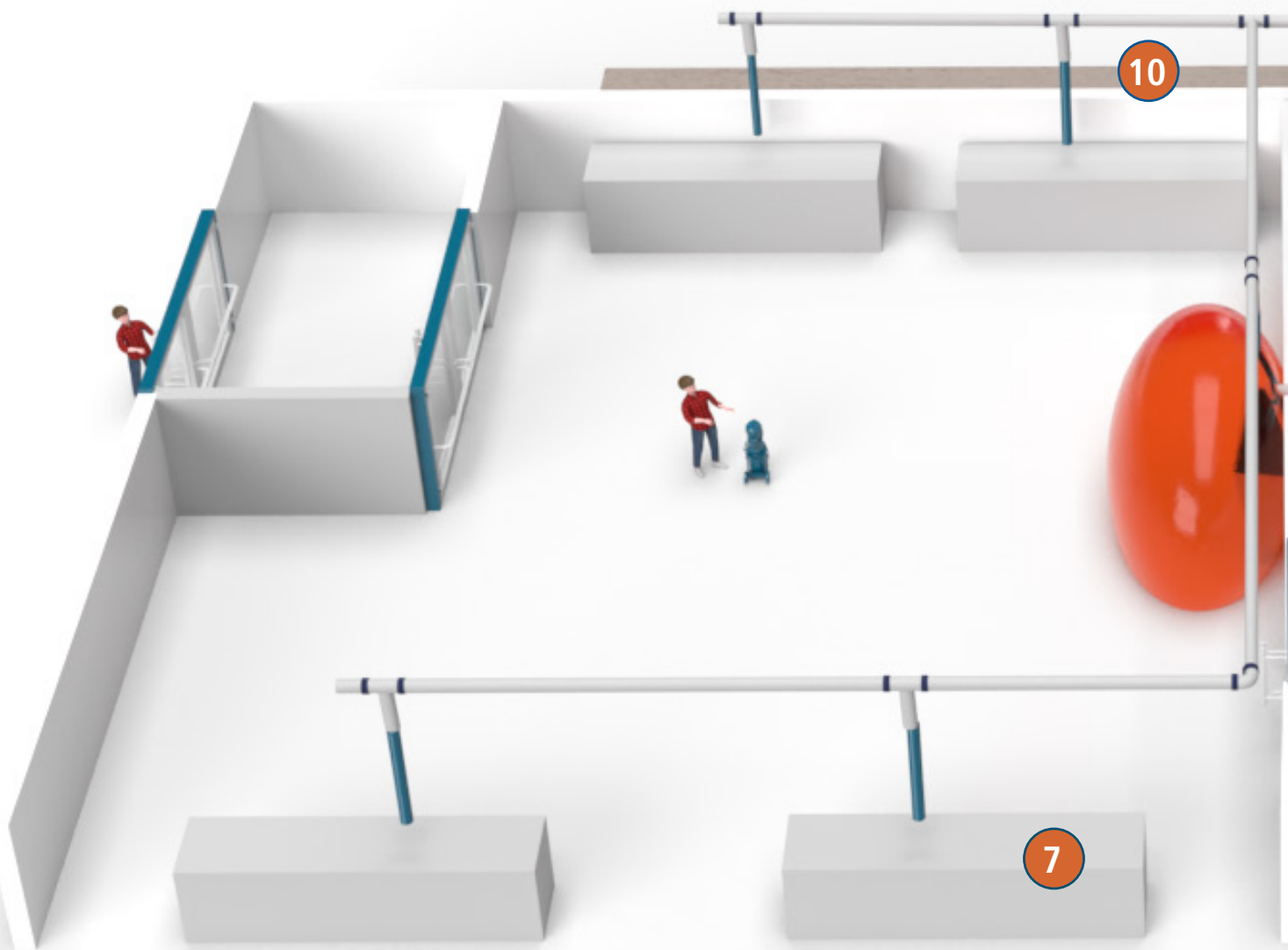
Zone 22

Location where explosive atmospheres in the form of a cloud of combustible dust are unlikely to form in the air during normal operation, or if one occurs, is nevertheless short-lived.



ATEX installation

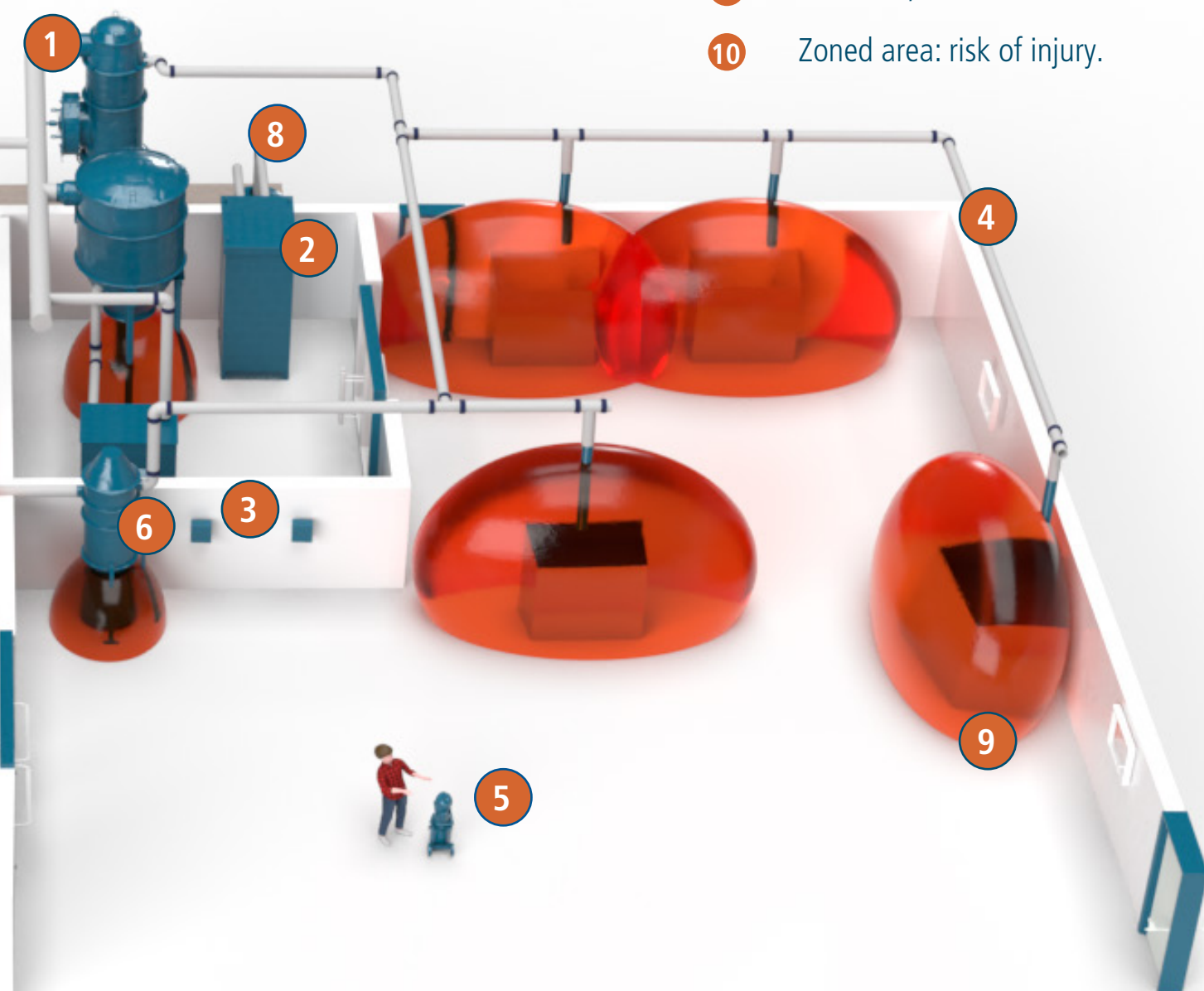
- 1 S 21000 filter unit reinforced to 0,5 bar with a explosion vent panel.
- 2 TRP 47, Turbopump.
- 3 Electrical cabinet.
- 4 Tubing system connected to wood processing machinery.
- 5 DC 2800 EX.



Welding and steel preperation workshop



- 6 Pre-Separator.
- 7 Welding fumes system.
- 8 HEPA Box.
- 9 Risk area, Zone 22.
- 10 Zoned area: risk of injury.



Woodworking workshop

Stationary modules for ATEX

Design

The ATEX directive and harmonised standards provide excellent guidance on the chain of documentation, calculations, construction, user instructions, validations and certificates that ensure protection against dust explosions. This protection is provided in two stages: firstly, the prevention of sources of ignition, and secondly an explosion panel that releases the combustion pressure if ignition should occur anyway.

Vacuum accessories

By earthing and equalising the potential of all elements of the system, and by only using ESD-certified vacuum accessories, the charging and discharging of static electricity is avoided, thus eliminating one potential source of ignition.

Filter units

Our filter units for ATEX are earthed and the filters are treated to conduct charges. They have pressure relief flaps that release any combustible gases without the pressure in the filter unit reaching hazardous levels. The filter unit is reinforced with drawbars and heavy-duty fittings to withstand the design pressure. In the event of ignition, the flap will open and a puff of flame and smoke

will be ejected. This is why a protection zone should be set out around the flap in accordance with the specifications for the case in question.

S 11000 EX / S 21000 EX / S 34000 EX are high vacuum dust collectors for potentially combustible dust. The units comply with the ATEX directive.

S 11000 EX / S 21000 EX / S 34000 EX meet various extraction requirements and to meet the challenges and rapid changes presented to modern industry. The systems are all marked with the EX symbol and are category 3D equipment according to directive 2014/34/EU. Filter cleaning with Reverse Pulse.

The S 11000 EX EVN 420 / S 21000 EX EVN 420 / S 34000 EX EVN 420 are equipped with a resettable type of explosion relief valve with flame retardant function. If the valve opens, it can be reset. For safety reasons, a manual reset must be performed after inspection and any action. This explosion relief valve is not approved for use with metal dust. In these cases, another solution must be applied. When ordering any of these cyclones, material data from the customer must be attached. This is because a control calculation must be performed in each individual case to ensure correct dimensioning.

Since 1 July 2006, all new and existing installations must fully comply with the ATEX directive.

Stationary Filter Units

S 11000 EX



Technical data S 11000 EX

H x W x D [mm]	2225x675x650
Weight [kg]	85
Inner diameter Ø [mm]	477
Inlet Ø [mm]	108
Outlet Ø [mm]	108
Flow max [m³/h]	1000
Soiled side air volume [l]	251
Filter Material	429206 x 1
Total Filter Area [m²]	8,4
Degree of separation EN 60335 [%]	>99;9
Collection container [l]	60
Max temperature filter [°C]	130
Q-pipe	Optional*
P _{red} [bar]	0,5
Filter cleaning with reverse air pulse	
Compressed air [bar]	4 l/s, 4 bar
Connection, hose [mm]	6/8
El connection	24 V DC, 12 W

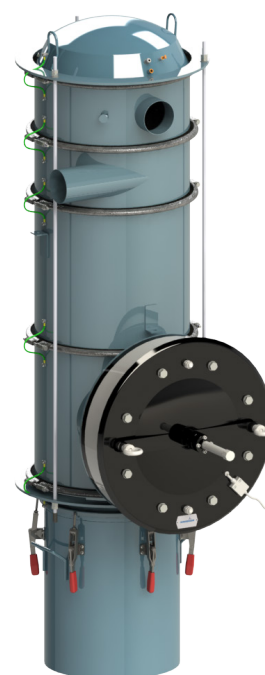
*For flameless venting select 110303

 **CE II3D**



Part No S 11000 EX

110301



Part No S 11000 EX EVN 420

110303

Stationary Filter Units

S 21000 EX



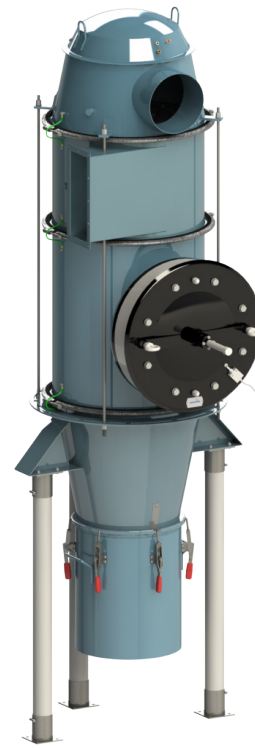
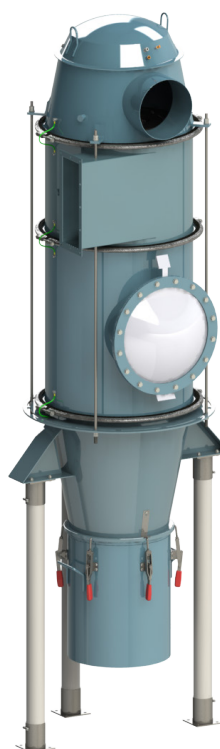
Technical data S 21000 EX

H x W x D [mm]	3000x1000x950
Weight [kg]	170
Inner diameter Ø [mm]	596
Inlet Ø [mm/in]	Optional*
Outlet Ø [mm]	250/160
Flow max [m³/h]	1500
Soiled side air volume [l]	464
Filter Material	428402 x 1
Total Filter Area [m²]	12
Degree of separation EN 60335 [%]	>99;9
Collection container [l]	60
Max temperature filter [°C]	130
Q-pipe	Optional**
P _{red} [bar]	0,5
Filter cleaning with reverse air pulse	
Compressed air [bar]	4 l/s, 4 bar
Connection, hose [mm]	6/8
EI connection	24 V DC, 12 W

*Note that the dirt volume in the filter changes depending on the size of the inlet.

**For flameless venting select 110303

Ex CE II3D



Part No S 21000 EX

119201

Part No S21000 EX EVN 420

119202

S 34000 EX



Technical data S 34000 EX

H x W x D [mm]	3250x1250x1325
Weight [kg]	330
Inner diameter [mm]	Ø 1046
Inlet Ø [mm]	Optional
Outlet Ø [mm]	250/160
Flow max [m³/h]	4000
Soiled side air volume [l]	1312
Filter Material	429206 x 4
Total Filter Area [m²]	34
Degree of separation EN 60335 [%]	>99;9
Collection container [l]	60
Max temperature filter [°C]	130
Q-pipe	optional
P _{red} [bar]	0,5
Filter cleaning with reverse air pulse	
Compressed air [bar]	4
Connection, hose [mm]	6/8
EI connection	24 V DC, 12 W

*Note that the dirt volume in the filter changes depending on the size of the inlet.

**For flameless venting select 110303

Ex CE II3D



Part No S 34000 EX

105901

Part No S34000 EX EVN 420

105902



1-phase Dust Extractors

DC **1800** H EX

DC **2800** H EX



DC 2800 H EX

DC 1800 H EX

Part No DC 1800 H EX

124000	230V, 50/60 Hz, EU
124001	230V, 50/60 Hz, UK
124002	115V, 50/60 Hz, UK
124003	115V, 50/60 Hz, US/CAN

Part No DC 2800 H EX

124100	230V /50/60Hz, EU
124101	230V /50/60Hz, UK
124103	115V /50/60Hz, US/CAN



1-phase



II 3D Ex tc IIIB T5 Dc IP54 10°C <=ta <=30°C

Mobile dust extractors

The DC 1800 and 2800 H EX are suitable for general cleaning and source extraction. The DC 1800 H EX is small and lightweight and as such, suitable for those that need a highly portable machine that still is powerful enough for source extraction. The DC 1800 and 2800 H EX are equipped with a steel container. The machines are equipped with a brushless motor (for spark-free operation) and certified to IP54 standard (non conductive dust).

The EX-line is especially designed for industries where there is a risk of explosion and also high demands for clean production, such as the wood, food production and electronics industries. The machines fulfil the requirements of the ATEX Zone 22 directive 2014/34/EU. Cleaning accessories from Dustcontrol are also available to meet these regulations.

Zone 22 is an area where an explosive environment, created by combustible airborne substances, does not occur in normal operation or only occurs short-term. These machines are equipped with steel containers, earth-bonded parts and antistatic accessories. **The machines for non-conducting material** are enclosed to IP54 standard. **For conductive material**, IP65 standard is required.

The machines are virtually maintenance free and can extract dust in a vast range of applications such as source extraction when using power tools for grinding, cutting and drilling applications as well as general cleaning.

Supplied with (Part No) DC1800 / DC 2800 H EX

Suction hose ATEX, Ø38, 5 m/ 20 in. (2027)
Coupling socket (2115E)
Coupling socket 50/38 (2108E)
Floor nozzle (7235E)
Suction pipe Ø38 mm/1.5" (7257)
Plastic bag (42951)
Fine filter, polyester (42028-01)
HEPA H13 filter (42027)



Technical data DC1800 / DC 2800 H EX

HxWxD DC 1800 [mm]	840x400x400
HxWxD DC 2800 [mm]	1200x440x600
Weight DC 1800 [kg]	16.5
Weight DC 2800 [kg]	24.5
Inlet DC 1800 [mm]	Ø 50
Inlet DC 2800 [mm]	Ø 50
Dust collector DC 1800 [l]	20
Dust collector DC 2800 [l]	40
Flow max, open inlet DC 1800 [m³/h]	200
Flow max, open inlet DC 2800 [m³/h]	200
Negative pressure, max. DC 1800 [kPa]	27
Negative pressure, max. DC 2800 [kPa]	27
Power rating DC 1800 [W]	1500
Power rating DC 2800 [W]	1500
Fine filter, polyester, area [m²]	1,5
Degree of separation, fine filter [%]	99,9
Filter area, HEPA filter [m²]	0,85
Filter classification, EN 1822-1	HEPA H13
Filtration efficiency, machine, EN 60335-2-69, Appendix A-A, Class H [%]	99,995
Sound level [dB(A)]	70

Stainless Steel



Dustcontrol's DC 1800/2800 H EX SS are valued both for its easy handling and capacity when being used to reduce the risks of potential dust explosions in ATEX Zone 22 (non-conductive dust).

However, there are areas with high hygienic demands (e.g. the food processing industry), which surpass the abilities of our standard DC 1800/2800 H EX SS.

Suitable for operation in environments with potentially combustible dust (non-conductive); stainless steel design enables the use of alkaline wash solutions; high resistance to acids.

Supplied with (Part No) DC1800 / DC 2800 H EX SS

Suction hose ATEX, Ø38, 5 m/ 20 in. (2027)
Coupling socket (2115E)
Coupling socket 50/38 (2108E)
Floor nozzle (7235E)
Suction pipe Ø38 mm/1.5" (7257)
Plastic bag (42951)
Fine filter, polyester (42028-01)
HEPA H13 filter (42027)



Technical data DC1800 / DC 2800 H EX SS

HxWxD DC 1800 [mm]	840x400x400
HxWxD DC 2800 [mm]	1200x440x600
Weight DC 1800 [kg]	16.5
Weight DC 2800 [kg]	24.5
Inlet DC 1800 [mm]	Ø 50
Inlet DC 2800 [mm]	Ø 50
Dust collector DC 1800 [l]	20
Dust collector DC 2800 [l]	40
Flow max, open inlet DC 1800 [m³/h]	200
Flow max, open inlet DC 2800 [m³/h]	200
Negative pressure, max. DC 1800 [kPa]	27
Negative pressure, max. DC 2800 [kPa]	27
Power rating DC 1800 [W]	1500
Power rating DC 2800 [W]	1500
Fine filter, polyester, area [m²]	1,5
Degree of separation, fine filter [%]	99;9
Filter area, HEPA filter [m²]	0,85
Filter classification, EN 1822-1	HEPA H13
Filtration efficiency, machine, EN 60335-2-69, Appendix A-A, Class H [%]	99,995
Sound level [dB(A)]	70



DC 1800 H EX SS



DC 2800 H EX SS

Part No DC 1800 H EX SS

124004	230V /50/60Hz, EU
124005	115V /60Hz, US/CAN
124011	230V /50/60Hz, UK

Part No DC 2800 H EX SS

124104	115V /60Hz, US/CAN
124105	230V /50Hz, EU



1-phase

IP54



II 3D Ex tc IIIB T5 Dc IP54 10°C <=ta <=30°C

3-phase Dust Extractor

DC Tromb Turbo EX

The DC Tromb H Turbo EX for ATEX zone 22 is a medium sized dust extractor that expand the Tromb Family. Because it is equipped with a powerful three-phase turbo motor is suitable for long hoses (up to 20 metres) and heavy cleaning (38mm accessories). It is available certified to IP65 standard, ATEX zone 22 (conductive dust).



Part No DC Tromb Turbo EX

173700 2.2 kW 400V /50Hz
173702 4hp 460V /60Hz, US/CAN



Ex II 3D T4 IP65, 10<=t_a<=40°C

Supplied with (Part No)

Suction hose Ø38/50 (2027 (2m), 2028 (5 m))
Coupling socket (2107E)
Coupling socket (2131)
Floor nozzle (7236E)
Suction pipe (Ø38 mm /1.5") (7257)
Plastic bag, conductive (5 pcs) (42285)
Antistatic Fine filter, polyester (44017-1)
HEPA H13-filter (44016)



Technical data

HxWxD [mm]	1390 x 600 x 840
Weight [kg]	88
Inlet Ø [mm]	Ø 50
Dust collector [l]	40
Flow max, open inlet [m³/h]	260
Negative pressure, max. [kPa]	28
Power rating [kW]	2,2
Fine filter, polyester, area [m²]	2,5
Degree of separation, fine filter [%]	99,9
Filter area, HEPA filter [m²]	2,2
Filter classification, EN 1822-1	HEPA H13
Filtration efficiency, machine, EN 60335-2-69, Appendix A-A, Class H [%]	99,995
Sound level [dB(A)]	72

3-phase Dust Extractor

DC 5800 Turbo EX

The DC 5800 H Turbo EX is designed for big hand-held power tools and heavy cleaning. The unit is of robust and sturdy design for maximum dependability, coupled with a direct driven turbo pump for continuous operation. It is certified to IP65 standard (conductive dust).



Part No DC 5800 Turbo EX

119312 4 kW 400V /50 Hz
119313 10 hp 460V /60 Hz



Ex II 3D T4 IP65, 10<=t_a<=40°C

Supplied with (Part No)

Suction hose ATEX, Ø50 mm, 7.5 m (2028)
Floor nozzle (7238E)
Suction pipe, Ø50 mm/2" (7265)
Fine filter, antistatic (429206)
HEPA H13 filter (42869)
Plastic bag (5psc) (42111)



Technical data

HxWxD [mm]	1942x780x1160
Weight [kg]	170
Inlet Ø [mm]	Ø 76
Dust collector [l]	40
Flow max, open inlet [m³/h]	470
Negative pressure, max. [kPa]	28
Power rating [kW]	4
Fine filter, polyester, area [m²]	8,3
Degree of separation, fine filter [%]	99,9
Filter area, HEPA filter [m²]	2,7
Filter classification, EN 1822-1	HEPA H13
Filtration efficiency, machine, EN 60335-2-69, Appendix A-A, Class H [%]	99,995
Sound level [dB(A)]	<75

Compressed Air Driven Dust Extractors

DC 1800/2800 TR EX

The DC 1800/2800 TR EX removes dust in three stages. The first separation occurs in the unit's cyclone, which is a very efficient separation of all the coarser dust. The finer dust is separated in the unit's filter cartridges, and then the HEPA filter takes care the rest of the dust. Filter cleaning with pulse provides long filter life and constant capacity. Vacuum is created in the ejector. The ejector is maintenance free.

Part No DC 1800 TR EX 101890

Supplied with (Part No)

Fine filter polyester (42029-01)
Plastic bags (42384)
HEPA H13 filter (42027)



Technical data

HxWxD [mm]	DC1800	DC1800 825x380x380
	DC 2800	DC 2800 1195x440x550
Weight [kg]	DC1800	DC1800 10 DC 2800 19
Inlet Ø [mm]	50	
Hose length [m]	5 m Ø 38	
Collection container [l]	20	
Flow max [m³/h]	170	
Negative pressure, max. [kPa]	16	
Fine filter, polyester, area [m²]	1,5	
Degree of separation, fine filter [%]	99,9	
Filter area, HEPA filter [m²]	0,85	
Filter classification, EN 1822-1	HEPA H13	
Filtration efficiency, machine, EN 60335-2-69, Appendix A-A, Class H	99.995	
Sound level [dB(A)]	68	
Compressed air consumption at 7 bar	20 l/s	
Grounding	Connection via compressed air hose.	
Connection dimension	R ½"	
Rec. quick coupling and pneumatic hose	5/8"	

Compressed Air Driven Dust Extractors

DC 3800 TR S EX

The DC 3800 TR S EX is a compressed air driven extractor for use in areas where electrical power is not available or practical. The DC 3800 TR S EX is a machine with large suction capacity and robust construction while still being compact and easy to manoeuvre. It is ideal for source extraction on most types of hand-held tools and for industrial cleaning (38 mm and 50 mm system).

Part No DC 3800 TR S EX 117100

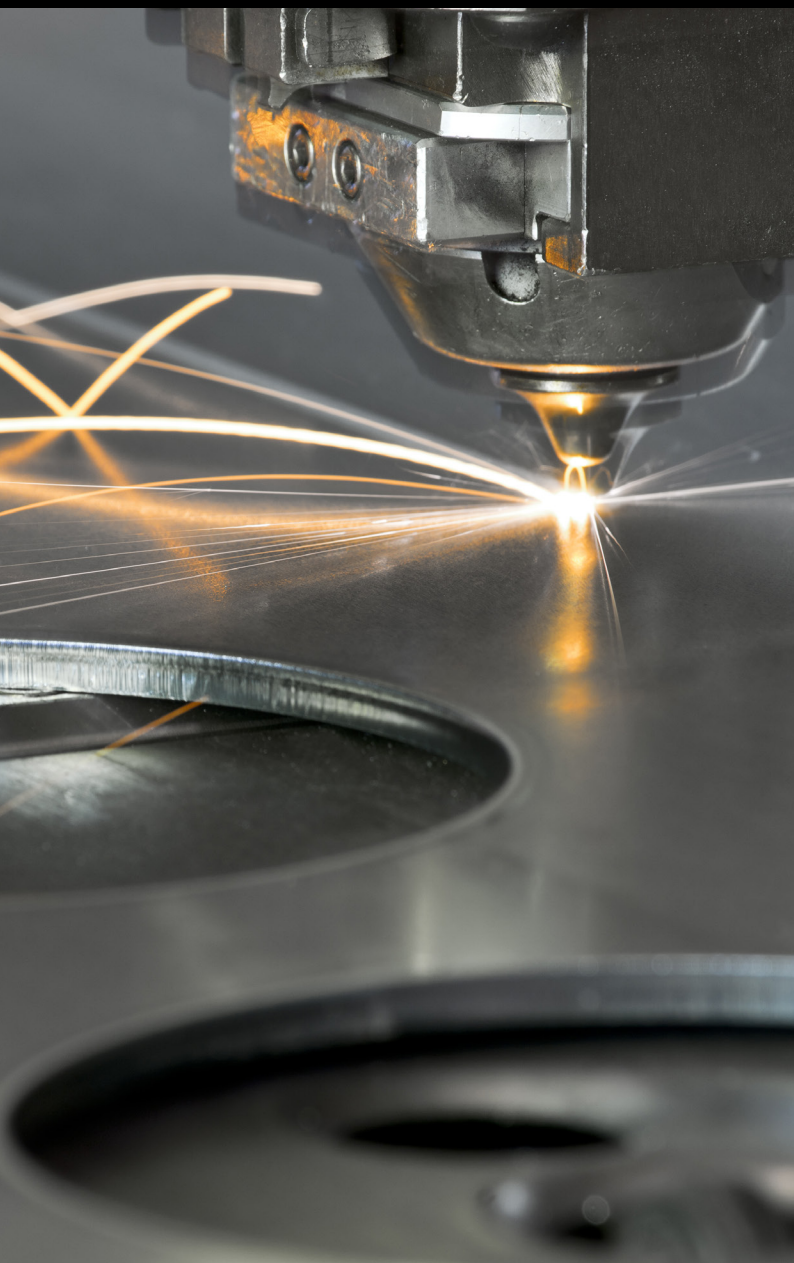
Supplied with (Part No)

Plastic bag, standard antistatic, ESD (42384)
Fine filter, antistatic (4202501)
HEPA H13 filter (42024)



Technical data

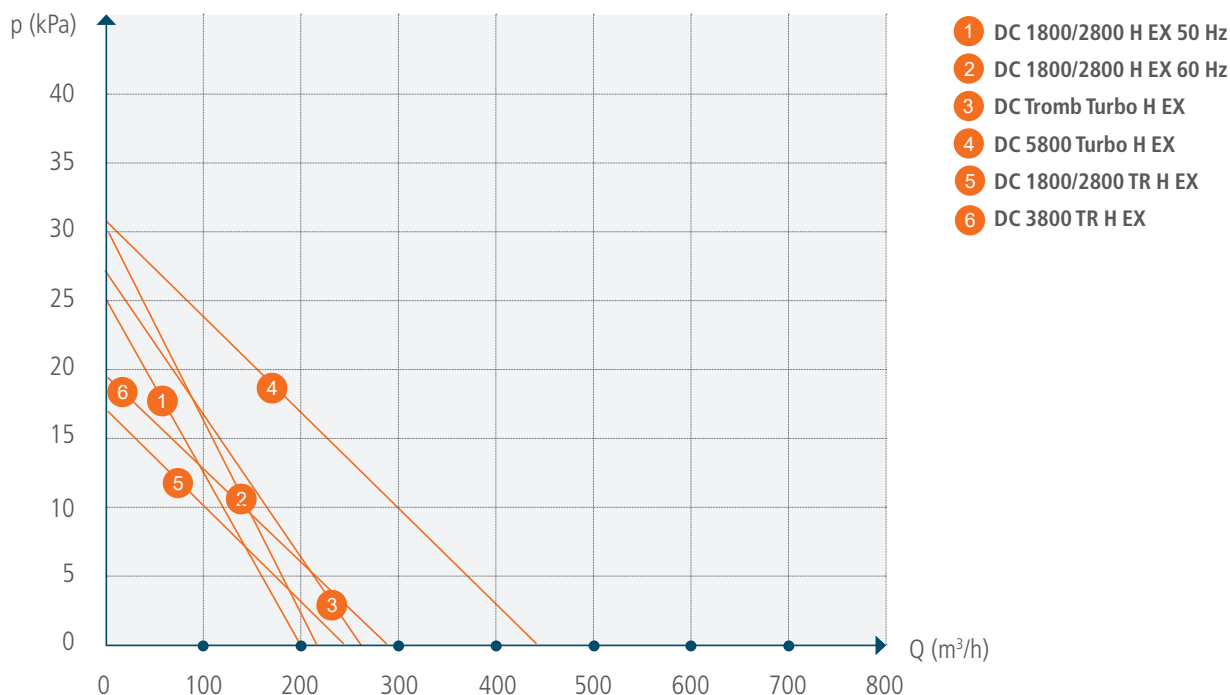
HxWxD [mm]	1390x600x920
Weight [kg]	38
Inlet Ø [mm]	50
Hose length [m]	5 m Ø 38
Collection container [l]	40
Flow max [m³/h]	300
Negative pressure, max. [kPa]	20
Fine filter, polyester, area [m²]	1,8
Degree of separation, fine filter [%]	99,9
Filter area, HEPA filter [m²]	1,5
Filter classification, EN 1822-1	HEPA H13
Filtration efficiency, machine, EN 60335-2-69, Appendix A-A, Class H	99.995
Sound level [dB(A)]	75
Compressed air consumption at 7 bar	20 l/s
Grounding	Connection via compressed air hose.
Connection dimension	R 1"
Rec. quick coupling and pneumatic hose	1"



Guide to the right EX-machine



Capacity air flow EX-Line



TECHNICAL DATA	DC 1800 H EX	DC 2800 H EX	DC Tromb Turbo EX	DC 5800 Turbo EX
HxWxD [mm]	840x400x400	1200x440x600	1390 x 600 x 840	1942x780x1160
Weight [kg]	16.5	24.5	88	170
Inlet [mm]	Ø 50	Ø 50	Ø 50	Ø 76
Dust collector [l]	20	40	40	40
Flow max, open inlet [m³/h]	200	200	260	470
Negative pressure, max. [kPa]	27	27	28	28
Power rating [W]	1500	1500	2200	4000
Fine filter, polyester, area [m²]	1,5	1,5	2,5	5
Degree of separation, fine filter	99,9	99,9	99,9	99,9
Filter area, HEPA filter [m²]	0.85	0.85	2,2	2,7
Filter classification, EN 1822-1	HEPA H13	HEPA H13	HEPA H13	HEPA H13
Filtration efficiency, machine, EN 60335-2-69, Appendix A-A, Class H [%]	99,995	99,995	99,995	99,995
Sound level [dB(A)]	70	70	72	<75
Zone	22	22	22	22



Dustcontrol has over 50 years of experience in equipment and systems for potentially explosive dust.

By taking into account and minimizing the conditions required for a dust explosion, you as a customer can optimize and ensure efficient and safe production and work environment.

For us at Dustcontrol, it is and always has been natural to develop machines for and together with the professional construction industry and its requirements. Together we create the best solutions to soak up invisible and visible dust directly at the source. A clean work environment leads to a healthier workplace, less downtime and higher product quality.

With Dustcontrol as a business partner, you get a uniquely developed solution, developed to ensure and streamline your and your company's production and work environment.

You can find more information at
www.dustcontroluk.co.uk

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