

Caulmert Limited

Engineering, Environmental & Planning
Consultancy Services

Padeswood Works

Castle Cement Limited

Environmental Permit Variation Application

Operating Techniques & BAT Review Report

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Operating Techniques & BAT Review Report

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1.0 INTRODUCTION

1.1 Application Context

- 1.1.1 Caulmert Limited have been appointed by Castle Cement Limited (trading as Hanson Cement) to prepare an environmental permit variation application for permit ref. EPR/BL1096IB to include for the upgrade to the existing Clinker Dome dust filter and associated monitoring requirements for 'A11' in Table S3.2 of the permit, and also for the addition to Table S3.3 of the permit for a new surface water discharge point 'W3' at Padeswood Works site in Mold, Flintshire, North Wales. The site is located at postcode CH7 4HB.
- 1.1.2 This variation application is in response to Actions required by NRW Compliance Assessment Report (CAR) ref. CAR_NRW0040097, dated 14/06/2022, specifically Action 11 which requires the Operator to apply for a permit variation to include the emission point to surface water from the horseshoe ditch around the coal shed.
- 1.1.3 This application also provides the installation details of the upgraded dust filter and dust monitoring equipment located at the clinker entry point into the Clinker Dome and the proposed revised monitoring requirements for the non-kiln point source emission to air 'A11' for the Clinker Dome Filter in Table S3.2 of the permit. There will be no change to the location, activities or emissions from the replacement dust filter.

1.2 Document Structure

- 1.2.1 This report comprises an integrated approach of the Activities & Operational Techniques in application form Part C3 and also an assessment of compliance with Best Available Techniques (BAT). Activities are required to conform to BAT to show that operations at the site demonstrate that no significant pollution will be caused from the activity as a whole, in line with the Industrial Emissions Directive (IED).
- 1.2.2 The Part C3 form requests information about the activities the application relates to and the operating techniques that will apply to them, which includes:
- a) Types of activities;
 - b) Types of waste to be accepted;
 - c) Emissions (to air, water, sewers, land etc.);
 - d) Operating Techniques including technical standards;
 - e) General requirements in relation to managing emissions (substances, odour, noise, vibration etc.);
 - f) Types and amounts of raw materials;
 - g) Monitoring of point source emissions; and,
 - h) Energy efficiency & climate change.

1.3 Site Location and Surrounding Land Use

1.3.1 The Padeswood Works is operated by Castle Cement Limited (trading as Hanson Cement) and is located in Padeswood, Mold, Flintshire, postcode CH7 4HB, in North Wales.

1.3.2 The site is a large cement works installation accessed off the A5118 road and is situated 730m to the west of Penyffordd and approximately 1km to the southeast of Buckley, Flintshire.

1.3.3 The existing site infrastructure plan for the cement works is provided as attached drawing ref. P103/67.

1.3.4 An indicative site location plan is shown below in Figure 1:



Figure 1: Site Location Plan (source: Google Earth, 2022)

1.4 Industrial Emissions Directive

1.4.1 For the cement industry the regulator must exercise its relevant functions so as to ensure compliance with the provisions of the Industrial Emissions Directive (IED) 2010/75/EU. The 'Best Available Techniques Reference Document for the Production of Cement, Lime and Magnesium Oxide' (2013) covers the activities at the Padeswood Works:

- Raw material storage and preparation;
- Fuels storage and preparation;
- Kiln systems;
- Preparation and storage of products;
- Packing and dispatch.

- 1.4.2 The upgrade to the dust filter and monitoring probe at the clinker entry point into the Clinker Dome is considered to be in line with Best Available Techniques and will improve the effectiveness of dust management at the Clinker Dome. It should be noted that this dust filter only provides dust filtration at the location where clinker enters the store, and not the entire Clinker Dome store building, for which the filter only provides minimal filtration (see correspondence from Operator to NRW in Appendix 1 of the Supporting Document).
- 1.4.3 The BAT Conclusions for the Cement Industry with respect to the upgraded dust filter and dust monitoring equipment at the Clinker Dome at Padeswood Works are reviewed in Section 3 of this report.

2.0 ACTIVITIES & OPERATING TECHNIQUES – PART C3 FORM

2.1 Q1a Types of Activities

- 2.2 There will be no change to the existing activities or Directly Associated Activities at the site. This permit variation is to include for the upgrade to the dust filter and dust monitor probe located at the entry point where the clinker enters the Clinker Dome store building at Padeswood Works. This is in addition to adding new surface water discharge point 'W3' to the permit in response to Action 11 of Natural Resources Wales (NRW) Compliance Assessment Report (CAR) ref. CAR_NRW0040097, dated 14/06/2022. The new dust filter and monitoring equipment will be external to the Clinker Dome, as per the existing dust filter and probe, and a description is provided below.
- 2.2.1 The existing permitted activity to which this permit variation relates is Section 3.1 A(1)a of Schedule 1 of the Environmental Permitting Regulations – cement clinker production, discharge of clinker from the cooler to the clinker store or export facility, and discharge of emissions from the chimney or other process vents. There will be no change to the existing activities, activity capacities or storage capacities as a result of this permit variation.
- 2.2.2 The installation details of the upgraded dust filter and dust monitoring equipment at the Clinker Dome is summarised below and further details are provided in Appendices 1 and 2. The proposed revised monitoring requirements for the non-kiln point source emission to air 'A11' for the Clinker Dome Filter are to be changed in Table S3.2 of the permit, as per Section 2.9 of this report. There will be no change to the existing activities as a result of upgrading the dust filter, with dust management and monitoring to be improved by the upgrade.

New Dust Filter & Dust Monitoring Equipment

- 2.2.3 The existing dust filter in place at the clinker entry point to the Clinker Dome is a horizontal bag dust filter which was installed prior to the installation of Kiln 4 and is listed in the permit because the fan capacity is >10,000m³. In response to Improvement Condition 2 of the permit it is currently monitored continuously by a triboelectric filter monitor probe. The existing filter collects the dust and drops it into a skip for recycling into the cement production process. The Operator has sought capital funds for improvement and therefore it is proposed to replace the existing bag filter with a 'DCE Envirojet Reverse Jet Bag Filter' or equivalent, which will take dust from the conveyor belt and send it to the store for incorporating into the cement milling process. The new filter is to be monitored using a 'SICK Dusthunter SP100' dust probe with forward scattered light measurement.
- 2.2.4 The technical specification for the 'DCE Envirojet Reverse Jet Bag Filter' is provided in Appendix 1. The information brochure for the 'Dusthunter SP100' dust monitoring probe is provided in Appendix 2. The preliminary layout of the filter system integrated with the clinker conveyor extraction is provided as attached drawing ref. C22-13043-11RevB.
- 2.2.5 The upgrade of the existing dust filter at the Clinker Dome will improve dust management at the Clinker Dome. The improvement to dust management at the site and upgrade of dust

monitoring equipment is considered to represent the Best Available Techniques (BAT) for the manufacture of cement and control of dust at the site.

DCE Envirojet Reverse Jet Bag Filter – Overview

- 2.2.6 The following describes the solution from DCE. The upgraded filter will be this or equivalent.
- 2.2.7 Dust Control Environmental (DCE) will install the proposed dust extraction equipment, specifically the ‘Envirojet Reverse Jet Bag Filter’, to the Clinker Dome at Padeswood, in accordance with the scope in Appendix 1 and drawing ref. C22-13043-11RevB. This option of filter is concluded to be the most cost effective and energy efficient solution for the Clinker Dome, based on an 18 to 20m/sec duct velocity, a 710mm diameter hood connection and a 28,000m³/hr air volume. The equipment is designed to be able to handle fine to medium clinker dust, requiring a 500v power supply. The advantages of this equipment, as stated by DCE, are as follows:
- Oval filter bag design reducing foot print.
 - Pre-separation raw gas inlet waste drop out system.
 - Filter with reverse jet cleaning offering 24hrs a day, 7days a week operation.
 - Body construction from 3mm.
 - Fast change non-tool filter media removal.
 - Trough hopper section with single point dust collection.
 - Compact footprint.
- 2.2.8 The Envirojet filter is to have a filter area of 306m², a filtration velocity of 1.52m/min, 180 bags and 30 valves. The filter externally will have a powder coated finish.
- 2.2.9 The filtration media includes a bag size 254mm x 3000mm long, with zinc plated filter cages.
- 2.2.10 The filter includes a filter cleaning system, that involves a compressed air header tank and connection, pulse diaphragm and electronic solenoid diaphragm valves, integral mounted assembly to reduce pulse noise output, a control unit and digital display screen.
- 2.2.11 The filter body features a 3mm steel plate with dual folded panel construction, hopper and pyramid hopper from 3mm fully welded steel, support legs, module panel, raw gas inlet and raw gas inlet baffle to allow waste separation.
- 2.2.12 A caged vertical access ladder and top handrails are to be installed alongside the 4m long x 2m wide rectangular sampling platform, with hinged filter access doors to allow access to the filter media.
- 2.2.13 For waste collection and removal, the filter is provided with a trough waste collection hopper, heavy duty galvanised support legs, rotary valve discharge, screw conveyor and discharge chute with finger guard to belt.

- 2.2.14 Other components of the filter include a fan ventilator, with a fan speed of 2940rpm, an acoustic air diffuser mounter to fan outlet with air/noise silencer, an emission alarm and break alarm (should the filter fail), a controller/start-stop panel, and a 12m high single-flue stack. Further detail of the specifications of each component are provided in the DCE brochure in Appendix 1.

SICK Dusthunter SP100 – Overview

- 2.2.15 The ‘Dusthunter SP100’ probe is the device to be installed at the Clinker Dome to measure dust concentrations, manufactured by ‘SICK’. This probe is approved according to the following standards: EN 15267, MCERTS and 2010/75/EU Industrial Emissions Directive.
- 2.2.16 The probe is designed with forward scattered light measurement for monitoring dust filter systems by using a laser light source and a particle detector to sense light scattered by particles illuminated by the laser beam. The probe is low maintenance due to self-monitoring (automated check of zero and reference) and contamination checks.

2.3 Q1b Types of Waste

- 2.3.1 There will be no change to the listed fuels in the permit as a result of this permit variation.

2.4 Q2 Emissions to Air, Water or Land

Point source emissions to air

- 2.4.1 There will be no additional point source emissions to air as part of this permit variation. There will be no change to the emissions from the existing combustion process. Dust emissions from the Clinker Dome will not increase and will be more effectively managed at the site due to the upgraded dust filter and monitoring equipment at the Clinker Dome.

Point source emissions to water (other than sewers)

- 2.4.2 It is proposed to add new surface water discharge point ‘W3’ to Table S3.3 of the permit for uncontaminated surface water run-off from the coal shed area and clinker dome area that discharges into the horseshoe ditch and subsequently to the Black Brook. The attached drawing ‘Environmental Permit Plan’ drawing ref. 5426-CAU-XX-XX-DR-V-1800 has been updated to reflect the addition of ‘W3’ to the permit. The surface water run-off from this area of the site is considered to be uncontaminated and therefore a H1 Surface Water Pollution Risk Assessment has not been undertaken as part of this permit variation and no monitoring parameters or emission limits are proposed.
- 2.4.3 Any other rainwater and surface run off water from the site will continue to be collected in the existing works drainage network, which currently collects surface water run-off which then passes through an oil-water separator into the works settling pond, before being returned to the works for use as cooling water. In periods of high rainfall and low production it is sometimes necessary to discharge water from the settling pond to surface water if the level in the settling pond becomes too high. This operation is unlikely to change as a result of

the permit variation. Surface water monitoring at the site will continue to be done in accordance with the environmental permit.

Point source emissions to sewers, effluent treatment plants or other transfer off-site

- 2.4.4 There will be no additional point source emissions to sewers, effluent treatment plants or other transfer off-site as part of this permit variation.

Point source emissions to land

- 2.4.5 There will be no additional point source emissions to land as part of this permit variation. Good housekeeping as per procedures in the existing site's Environmental Management System will ensure there is no additional risk to land from the site's activities.

2.5 Q3a Technical Standards

- 2.5.1 There will be no changes to the operation of the kiln or clinker transport or cooling system or any of the other activities at the site. This permit variation concerns the new dust filter and dust monitoring probe for the Clinker Dome, and new surface water discharge point 'W3' only. The following technical standards will be followed to control emissions from the Clinker Dome and surface water run-off as a result of this permit variation:

- Cement, Lime and Magnesium Oxide BAT Conclusions (IED 2010/75/EU);
- Existing dust control measures as per the Integrated Management System.

2.6 Q3b General Requirements

- 2.6.1 It is considered that the upgrade of the dust filter at the Clinker Dome will improve the dust monitoring and management at the site, therefore improving the environmental protection from potential dust emissions at the site from the clinker transport process. The upgrade to the dust filter complies with 'Best Available Techniques (BAT) Reference Document for the Production of Cement, Lime and Magnesium Oxide', particularly BAT Conclusions 14-18 in Section 1.2.5 of the BAT document and in accordance with the 'Description of techniques for the cement industry – Dust emissions' in Section 1.5.1.

- 2.6.2 An environmental risk assessment is not considered necessary for this permit variation because this variation is simply for an upgrade to the existing dust filter and dust monitoring probe, which will not increase any risks to the environment and will in fact improve dust control and management at the site.

- 2.6.3 As part of this permit variation, a new surface water discharge point 'W3' is also proposed to allow for uncontaminated surface run-off from the site to be discharged into the horseshoe ditch and subsequently the Black Brook. Table S3.3 of the permit is to be updated as per Section 2.8 of this report. Due to the uncontaminated nature of the run-off, a H1 Surface Water Pollution Risk Assessment has not been considered necessary. The surface run-off will discharge from the clinker dome area and also the coal shed area, which has been cleared of all external stockpiles and going forwards will have no potentially contaminative sources

which could pollute surface waters leaving this area of the site. This permit variation is to inform NRW of this surface water emission point and include it in the permit. No monitoring parameters or emission compliance limits are proposed for 'W3'.

- 2.6.4 It is considered the upgraded dust filter for the Clinker Dome is an improved dust control measure at the site and will ensure the risk to sensitive receptors will remain low. This has been agreed verbally with the local NRW officer for the site. Air quality will continue to be monitored in line with the requirements within the existing Environmental Permit, with monitoring updated for 'A11' at the Clinker Dome as outlined in Section 2.9 of this report.

2.7 Q3c Types and Amounts of Raw Materials

- 2.7.1 There will be no change to the raw materials listed in the permit as part of this permit variation.

2.8 Q4a Monitoring Point Source Emissions

Point source emissions to water (other than sewers)

- 2.8.1 It is proposed to add new surface water discharge point 'W3' to Table S3.3 of the permit for uncontaminated surface water run-off from the coal shed area and clinker dome area that discharges into the horseshoe ditch and subsequently to the Black Brook. The new point 'W3' in Table S3.3 of the permit will read as follows in Table 1:

Table 1 – Addition of W3 to Table S3.3 of the Permit

Table S3.3 Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements						
Emission Point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
W3 on site plan in Schedule 7	Uncontaminated site surface water drainage.	No parameters set	No limit set	-	-	-

- 2.8.2 The attached drawing 'Environmental Permit Plan' drawing ref. 5426-CAU-XX-XX-DR-V-1800 has been updated to reflect the addition of 'W3' to the permit. The surface water run-off from this area of the site is considered to be uncontaminated and therefore a H1 Surface Water Pollution Risk Assessment has not been undertaken as part of this permit variation and no monitoring parameters or emission limits are proposed.

- 2.8.3 There will be no other changes to monitoring of point source emissions to water from the site, these will continue to be monitored in accordance with the permit.

Point source emissions to sewers, effluent treatment plants or other transfer off-site

- 2.8.4 There will be no change to, or additional, point source emissions to sewers, effluent treatment plants or other transfer off-site as part of this permit variation.

Point source emissions to land

2.8.5 There will be no additional point source emissions to land as part of this permit variation.

2.9 Q4b Point Source Emissions to Air

2.9.1 There will be no additional point source emissions to air as part of this permit variation. The monitoring of dust emissions at the upgraded dust filter (a 'DCE Envirojet Reverse Jet Bag Filter') that is to be monitored for particulate matter using a 'SICK Dusthunter SP100' probe with forward scattered light measurement will be amended in Table S3.2 of the permit to read as follows in Table 2:

Table 2 – Revision of A11 in Table S3.2 of the Permit

Table S3.2 Non-kiln point source emissions to air – emission limits and monitoring requirements						
Emission Point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A11 on site plan in Schedule 7 ^{Note 2}	Clinker Dome Filter	Particulate matter	10 mg/Nm ³	Periodic over a minimum 30-minute period	Quarterly for first year, 6-monthly thereafter	BS EN 13284-1

2.10 Q6a basic measures for improving how energy efficient your activities are

2.10.1 There are no changes to the kiln activity and energy efficiency of the activity as result of this permit variation.

2.11 Q6b Provide a breakdown of any changes to the energy your activities use

2.11.1 There are no changes proposed to the energy the activities at the site use and create as a result of this permit variation.

2.12 Q6c Have you entered into, or will you enter into, a climate change levy agreement?

2.12.1 Castle Cement Limited is no longer a participant in the climate change levy agreements. This is because the Government has exempted energy intensive industries in the mineral and metallurgical sectors from climate change levy payments under the taxation of energy products directive. As the company is no longer required to make levy payments it is not possible to remain in the cement sector climate change levy agreement. Hanson UK operations are covered by the Energy Efficiency Directive and Energy Savings Opportunity Scheme (ESOS). The requirements ESOS are met through certification to ISO50001. Site energy usage is reported monthly at the site and Hanson Cement executive level, energy saving opportunities are recorded in a database and progressed by the site energy team.

2.13 Q6e Avoiding producing waste in line with Council Directive 2008/98/EC on waste

2.13.1 There is no change to existing waste management at the site as part of this permit variation. Waste produced at the site will be dealt with as per existing procedures. Any waste oil arising from site maintenance work is recovered through the current site waste management procedures. The dust collected by the dust filter at the Clinker Dome is used in the cement milling process.

2.14 Appendix 6 Questions 1-13

2.14.1 There will be no changes to how the site activities are run as part of this permit variation. The new dust filter and monitoring probe will be operated and maintained in accordance with Best Available Techniques and manufacturer's instructions as presented in Section 3 and in accordance with the site's Environmental Management System.

3.0 BEST AVAILABLE TECHNIQUES (BAT) REVIEW

3.1 Review of BAT Conclusions

- 3.1.1 The BAT Conclusions within 'Best Available Techniques Reference Document for the Production of Cement, Lime and Magnesium Oxide' (2013) are reviewed briefly below as part of this permit variation, to consider the upgrade of the dust filter and monitoring probe at the Clinker Dome at Padeswood Works.
- 3.1.2 It is considered that the upgrade of the dust filter at the clinker entry point to the Clinker Dome will improve the dust monitoring and management at the site, therefore improving the environmental protection from potential dust emissions at the site from the clinker transport process. The upgrade to the dust filter complies with 'Best Available Techniques (BAT) Reference Document for the Production of Cement, Lime and Magnesium Oxide', particularly BAT Conclusions 14-18 in Section 1.2.5 of the BAT document and in accordance with the 'Description of techniques for the cement industry – Dust emissions' in Section 1.5.1.
- 3.1.3 Maintenance and cleaning of the new dust filter and monitoring probe at the Clinker Dome will be in accordance with BAT and manufacturers recommendations.
- 3.1.4 Castle Cement Limited (trading as Hanson Cement) operates the installation at Padeswood Works in accordance with an ISO14001 accredited environmental management system (EMS). The introduction of a new dust filter and monitoring probe at the Clinker Dome may require minor updates to the Management System that controls operations at the site to acknowledge the new equipment and any specific staff training requirements. However, most procedures overall will remain the same within the Management System that control the operation of the site or the Hanson-wide corporate procedures.
- 3.1.5 BAT is applied to minimise noise emissions from the dust filter and monitoring probe. Given that the new dust filter and probe is to directly replace the existing filter at the Clinker Dome and the system is of similar size to that existing, it is unlikely that there will any additional noise impact beyond the site boundary. This will be measured as part of the routine noise monitoring that the site conducts as per the permit.
- 3.1.6 The monitoring requirements for point source emission 'A11' at the Clinker Dome will be amended in Table S3.2 of the permit to read as per Section 2.9 of this report. There will be no other changes to the existing continuous and/or periodic monitoring of process parameters and emissions to air of other point source emissions as a result of this permit variation. Emissions will continue to be monitored in line with the requirements in the permit.

4.0 REFERENCES

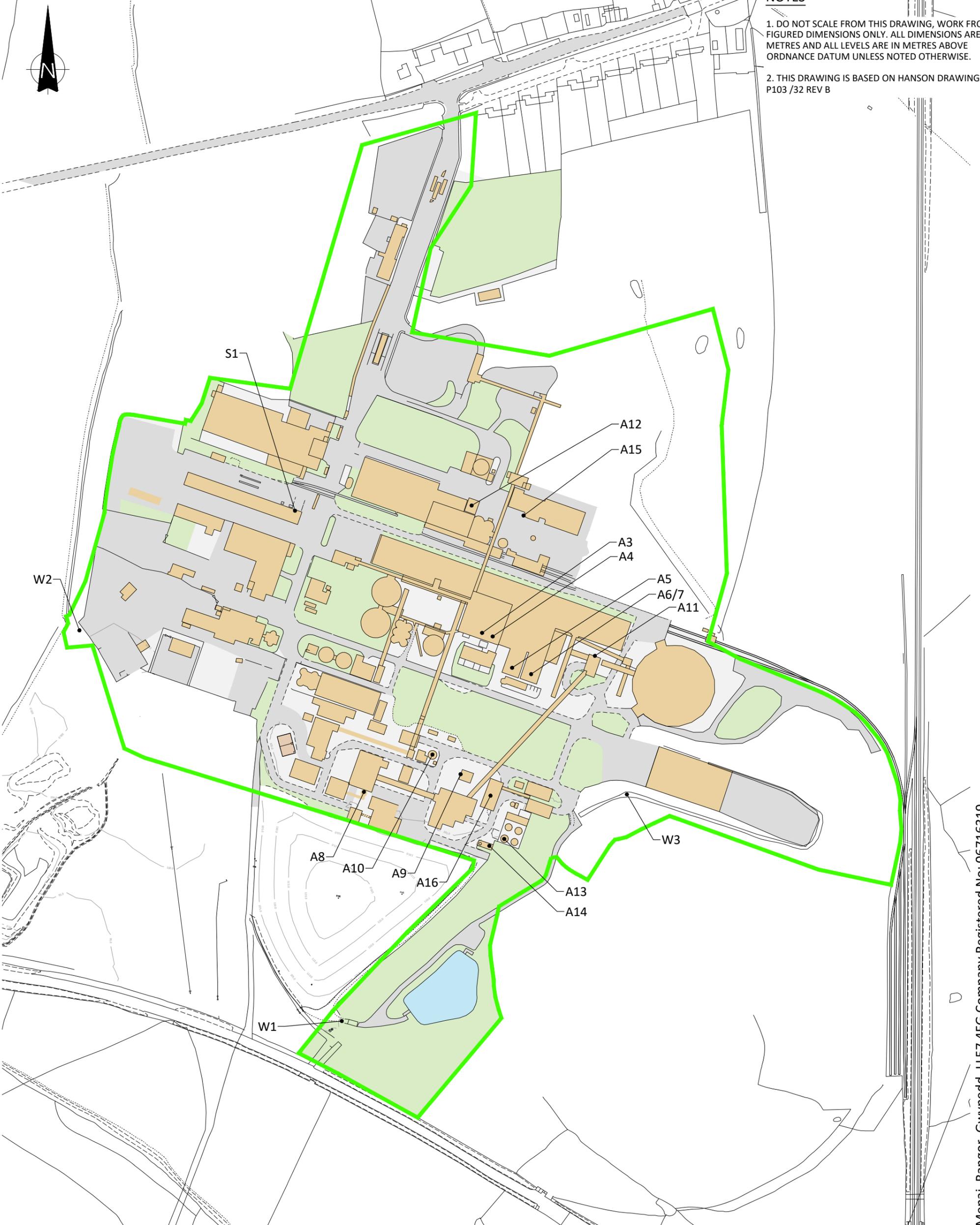
- Integrated Pollution Prevention and Control (IPPC), 2013 - 'Best Available Techniques (BAT) Reference Document for the Production of Cement, Lime and Magnesium Oxide', Industrial Emissions Directive 2010/75/EU.

DRAWINGS

5426-CAU-XX-XX-DR-V-1800 Environmental Permit Plan
P103/67 Existing Site Infrastructure Plan
C22-13043-11 Rev B Preliminary Filter Layout

NOTES

1. DO NOT SCALE FROM THIS DRAWING, WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN METRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.
2. THIS DRAWING IS BASED ON HANSON DRAWING P103 /32 REV B

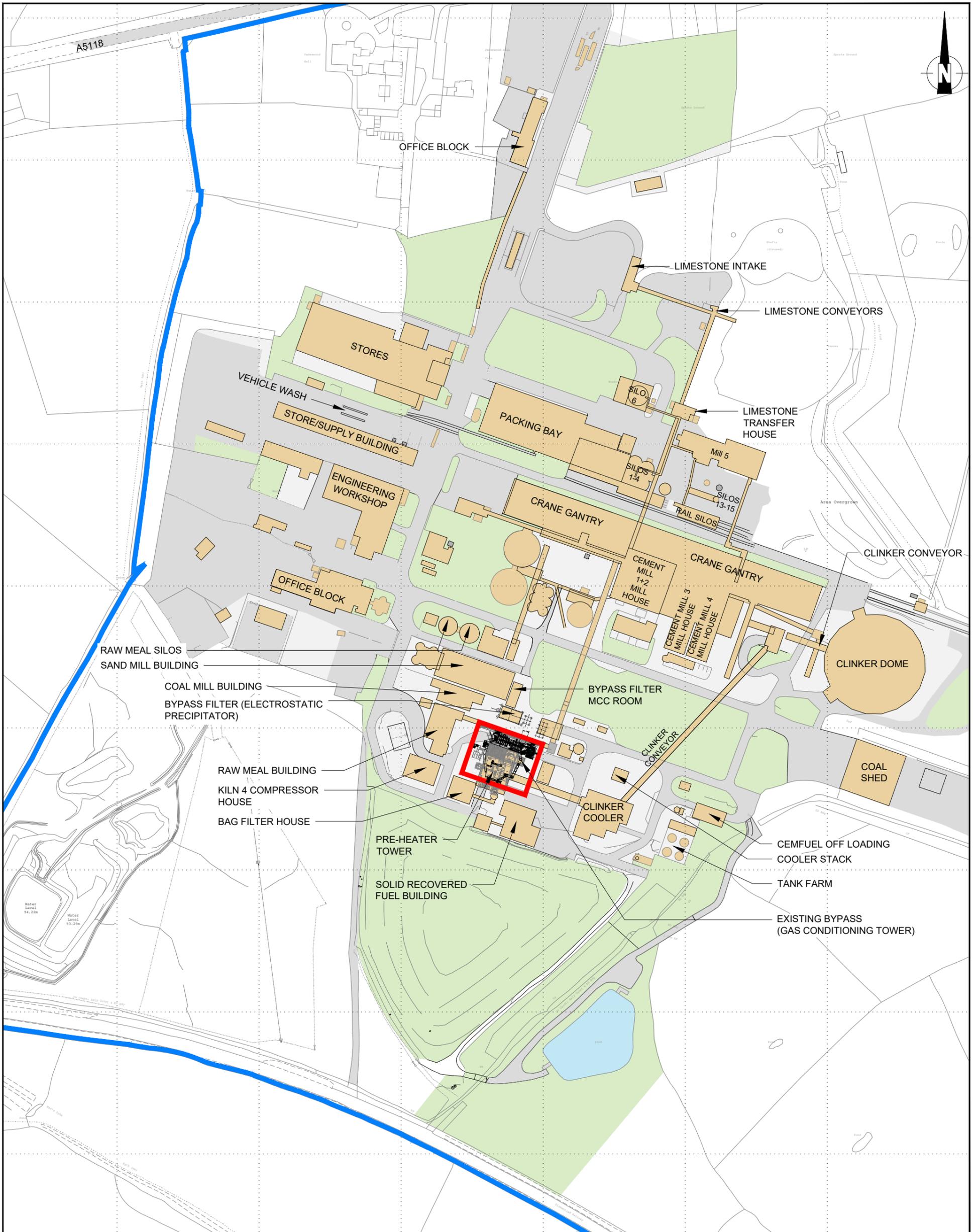


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CLIENT: 		PROJECT: PADESWOOD		TITLE: ENVIRONMENTAL PERMIT PLAN	
DRAWN BY EJD	REVIEWED BY SH	AUTHORISED BY SH	STATUS S2	PURPOSE OF ISSUE FOR INFORMATION	
JOB REF: 5426	DATE 17.04.2023	SCALE @ A3 1:3000	REVISION P02	DRAWING NUMBER 5426-CAU-XX-XX-DR-V-1800	





Legend

- Land Under the Control of the Applicant
- Planning Application Area



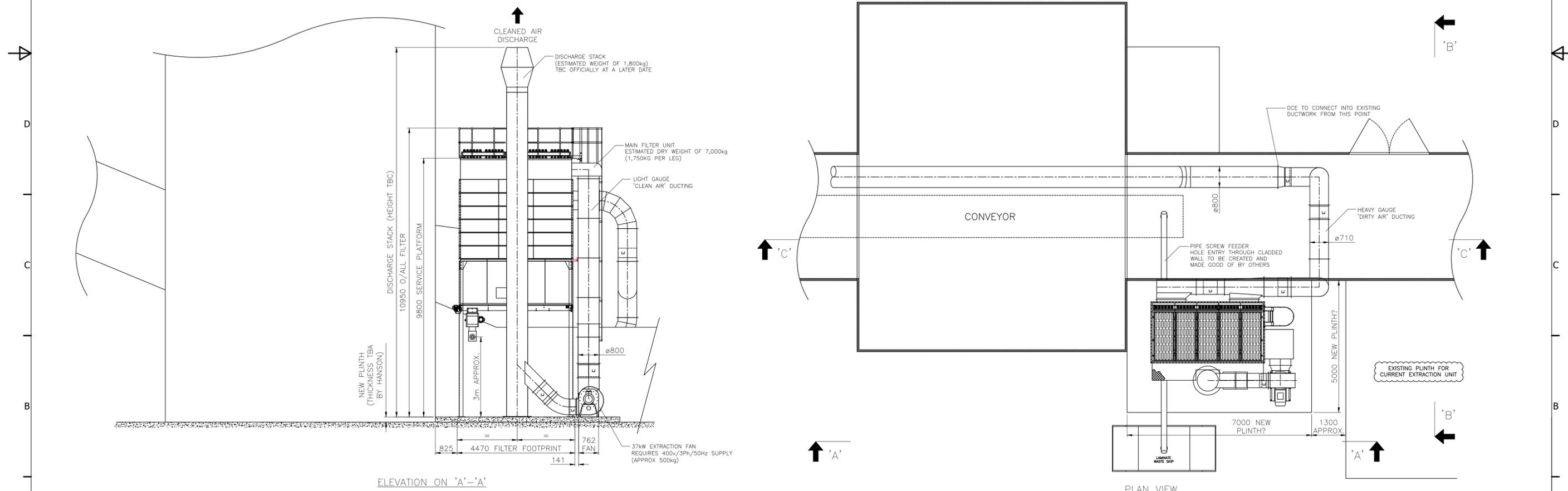
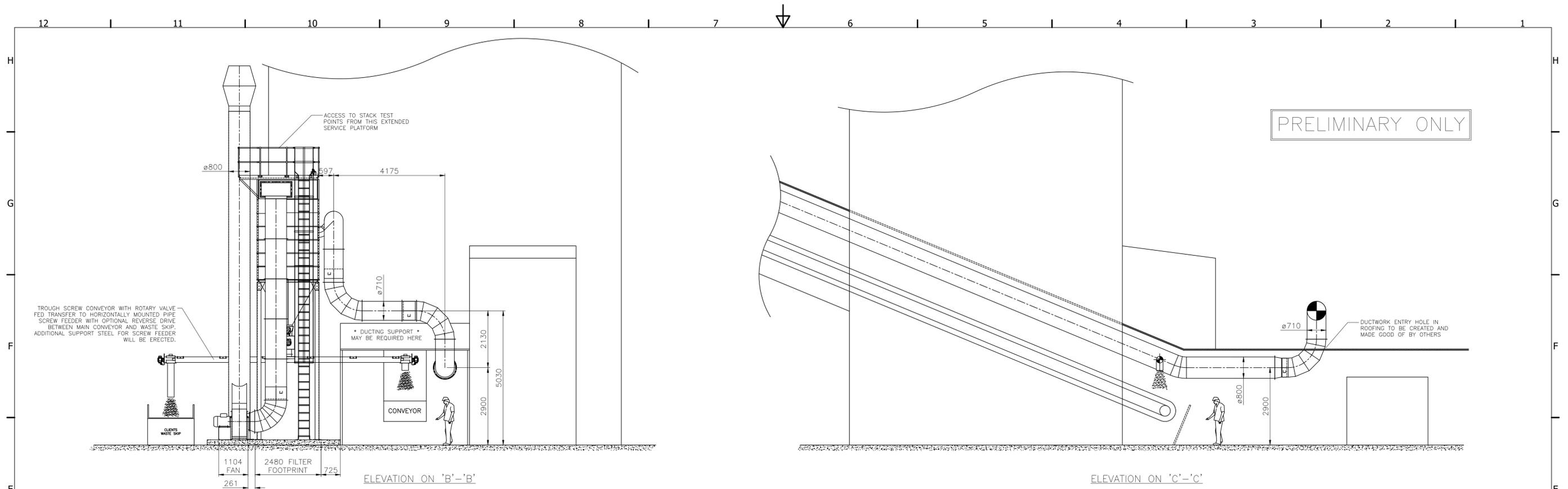
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Hanson
HEIDELBERGCEMENT Group

Site: **PADESWOOD - PLAN 3**

Title: **Existing Site Infrastructure Plan**

Scale: 1:2500 A3	Date: 23/03/2021	Drawing No.:
Drawn by: LG	Checked by: AB	P103/67



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 UNTOLERANCED MACHINED DIMENSIONS ± 0.25mm
 ALL BURRS & SHARP CORNERS TO BE REMOVED

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**IF IN DOUBT -
 ASK**

TITLE CLINKER CONVEYOR EXTRACTION			CLIENT HANSON CEMENT		
DRAWN	SB	26/09/22	SCALE	DRAWING NO. C22-13043-11	
APPROVED			NTS	REV B	
ISSUED					

TITLE CLINKER CONVEYOR EXTRACTION			CLIENT HANSON CEMENT		
DRAWN	SB	26/09/22	SCALE	DRAWING NO. C22-13043-11	
APPROVED			NTS	REV B	
ISSUED					

APPENDIX 1

DCE Envirojet Reverse Jet Bag Filter specifications



Our Ref : PR-7241-22-PG R1

Date: 9th August 2022

Hanson Cement
Padeswood Works
Chester Road
Mold
CH7 4HB

For the attention of Chris Sheady

RE: Proposed Dust Extraction to serve BF41 Clinker Dome

Thank you for your valued enquiry and the courtesy extended to the writer following my recent visit to your site. We now take pleasure in submitting our technical solution for the above project.

We trust the foregoing quotation meets with your requirements and look forward to hearing from you in due course. Should you require any additional information please do not hesitate to contact the writer.

Yours faithfully
DUST CONTROL ENVIRONMENTAL LTD

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TECHNICAL SPECIFICATION

Quotation number: PR-7241-22-PG

Dust Extraction Equipment to serve BF41 Clinker Dome



DUST CONTROL ENVIRONMENTAL

1 EXECUTIVE SUMMARY

1.1 Project Outline

In arriving at the design, the following supporting information has been referenced:

- Site visit
- Health and Safety HSG 258 guidance Note
- EH 40 Workplace Exposure
- LEV Report (out of date)

This proposal has been compiled with the most cost effective and energy efficient solution

- Dust Extraction equipment to serve the following points of extraction
- The figures are based upon 18/20m/sec duct velocity

MACHINE DESCRIPTION	HOOD CONNECTION	AIR VOLUME
1. Clinker Dome	710mm dia	28,000m ³ /hr

PLANT TOTAL	28000 M3/HR
--------------------	--------------------

1.2 Brief Scope of Supply

We include the following brief scope of supply:

- DCE Envirojet Reverse Jet Bag Filter
- Floor mounted fan set and attenuation
- Screw conveyor and Rotary Valve
- Mcerts Exhaust Stack
- Emission monitor and D! calculations
- Heavy Duty Extraction Ductwork
- Starter / controller
- Mechanical installation
- Autocad design
- Delivery
- Commissioning

1.3 Advantages of Our Solution

- Oval filter bag design reducing foot print
- Pre-separation raw gas inlet waste drop out system
- Filter with reverse jet cleaning offering 24hr/day 7 day per week operation
- Body construction from 3mm
- Fast change non tool filter media removal
- Trough hopper section with single point dust collection
- Compact footprint

1.4 Pricing

- 1 No Dust Extraction system to handle 28000 cu.m/hour
- High efficiency fan assembly with acoustics
- Ductwork system
- Mcerts Discharge stack
- Starter controller
- Autocad design
- Delivery to site, Installation & Commissioning
- Documentation Package

Budget Total (net without VAT):

£267,942.00



DUST CONTROL ENVIRONMENTAL

2 TABLE OF CONTENTS

1	Executive Summary
2	Table of Contents
3	Application Details
4	Equipment Technical Description
5	Price Compilation
6	Terms of Payment / Delivery
7	Schedule
8	General Terms and Conditions
9	Warranty



3 APPLICATION DETAILS

Application:	Dust extraction to identified points
Air volume:	28000m³/hr
Static pressure:	3500Pa
Temperature of dust:	Ambient
Ambient temperature:	60°C
Dust load:	Medium to High
Source material:	Identified points in production facility
Type of dust:	Clinker
Particle size:	Fine to medium
Special features:	None specified
Installation location:	External
Altitude:	Assumed to be <300m above sea level
Power supply:	500v-3ph- 50Hz
Dust like emissions:	<3mg/m³

The following products should not be used outside of the above application data.

In the event the process would be changed or modified, we recommend you contact DCE Limited to check if the product is still fit for its purpose.

4 EQUIPMENT TECHNICAL DESCRIPTION

Envirojet Filter Details

- Filter Ref Envirojet 306-180-306
- Filter Area 306M²
- Filtration Velocity 1.52m/min
- Number of bags 180
- Number of valves 30

Filtration Media

- Bag Size 254mm x 3000 mm long
- Filter Media DCE dust release
- Zinc plated filter cages included

Filter Cleaning System

- 150 Global compressed air header tank to 2014/68/EC
- Compressed air connection ½" BSP female
- 30 off 1.5" pulse diaphragm valve assembly
- Electronic solenoid diaphragm valve activation
- Coil voltage 24v DC
- Continuous, DP or post cleaning options
- Integral mounted assembly to reduce pulse noise output
- DPE8T differential pressure pulse sequence control unit
- Digital display screen confirming filter pd,
- Controller input voltage 110-1-50
- IP65 protection rating from water & dust
- Operating temperature -20 Deg C to +60 Deg C

Filter Body Construction & Features

- Main body 3mm mild steel plate dual folded panel construction
- Hopper & pyramid hopper from 3mm mild steel fully welded construction
- Support legs RSC & RSA sections hot dip galvanized
- Filter body Laser cut & CNC pressed panel construction
- Bolt together module panel system
- Raw gas inlet size 2 off at 750mm x 350mm inlet
- Raw gas inlet baffle integrated into plant to create waste separation
- Lift eyes for off-loading & positioning

Dirty Air Inlet

- Rectangular top mounted inlets
- Integral baffle plate included

Filter Media Access

- Top durbar hinged filter access doors
- 3mm welded construction
- Car door type seal fitted
- Cast retaining handles included
- Vertical access ladder and top handrails provided

Waste Collection & Removal

- Trough waste collection hopper
- 3mm hopper wall welded construction
- Heavy duty RSA & RSC support legs hot dip galvanized
- Rotary valve discharge included
- Screw conveyor
- Rotary valve 250
- Discharge chute and finger guard to belt

Paint Finish

- De-grease raw steel with a de-greasing agent
- Powder coated edge coat primer approx. 80 Micron thickness
- Powder coated semi-gloss fine textured top coat approx. 40 Micron thickness
- Overall paint thickness when baked approx. 120 Micron

Services

- Main fan input voltage 500-3-50
- Pulse control unit 110-1-50
- Compressed air 6 BarG (refer to drawing for volume per model)



“Typical Envirojet Filter c/w Bulk Bag Waste Collection”

Fan Ventilator Specification

- Fan duty 28000m³/hr @ 350mm wg
- Fan Ref CW7 600 R2
- Fan Size 600
- Inlet mounted designation integral mounted
- Direct driven fan set
- Fan Speed 2940rpm
- Absorbed power 34.5kW
- Motor rating 37kW
- Motor efficiency IEC60034-30 IE4
- Motor manufacturer WEG
- Mild steel fully welded construction

Acoustic Air Diffuser

- Air diffuser mounted to fan outlet
- The air silencer is lined with noise absorbent sound deadening material
- Typical noise output levels <85 db(A) @ 3M free field

Screw conveyor

Rotary airlock

Emission alarm

EN15859 requires an MCERTS sensor (STACK 980), which requires calibration to ISO-Kinetic Sampling Standard 13284-1

PCME (ENVEA) Break alarm Stack 980 Gross Filter failure detector complete with

- Dual alarm
- Relay outputs
- Icon driven display
- Break alarm sensor
- Probe rod
- Installation
- Commissioning
- Isokinetic stack test
- D1 Stack Calculations

Starter/Controller Specification

- Wall mounted IP55 enclosure
- 37kW vsd main fan starter
- 0.55kW rotary valve starter
- 5.5KW Screw Feeder
- MCB protected for main fans
- P56 metal enclosure
- Lockable mains isolator
- Transformer
- Start/Stop buttons
- E-Stop
- 110v feed to filter pulse sequence controller
- Over run timer for post-cleaning feature
- Fully engraved panel
- Wiring diagram

4.1 EXTRACTION DUCTWORK

Quantity: 1 set

- New Flanged and welded heavy duty galvanized ductwork will connect from the aforementioned extraction hood/s back to the filter c/w anti abrasion inlet box. The filter will be externally located as discussed.
- DCE Extraction ductwork to connect to identified points. DCE ductwork will be designed to give 18/20 m/sec conveying velocity to ensure no fall out of material
- Ductwork will be manufactured in galvanized mild steel material to a clipped for the clean air with flange bolted for the dirty air.
- Ductwork will be supplied with all necessary bends, volume control dampers and support brackets
- All ductwork will be supplied and installed to meet with HSG 258 requirements

Rotary Valve

TWA 250 ceramic extreme duty rotary valve

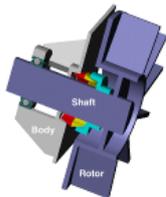
Outer non-wearing casing: carbon steel fabricated

Rotor: carbon steel fabricated with 92% alumina ceramic tiles

Non - adjustable liner: carbon steel fabricated with 92% alumina ceramic tiles

Bearings: outriggered spherical roller with independent sealing

Shaft seals: maintenance free mechanical seals, Viton 200°C max



Mechanical shaft seals never need adjusting or repacking so reduce your operating costs. They outlast the life of the valve, don't require expensive air purge and you don't lose product or have a messy working environment. We supply them lubricated for life and pre-adjusted. Unlike complicated seals, they're very cost effective at only a few hundred pounds per valve.

Drive: Direct drive

Gearmotor: SEW 400/3/50 IP54 0.55kW with thermistors suitable for 5-1 turndown

Product: Clinker dust

Bulk density: 1.7T/Mcu

Temperature: TBC

Rotor capacity: 7 litres/revolution

Rotor speed: TBC

Finish: painted standard MID system

Screw Feeder

Included in the price of the pipe screw conveyor:

- crew conveyor diameter d=250 mm,
- coil pitch P=130-150-180 mm,
- length L=6000 mm,
- angle of inclination of the conveyor 30°,
- gearmotor power P = 5.5 kW,
- gearmotor producer - SEW,
- capacity up to 3,5 m³/h (5040 kg/h) with 80% filling, for 1440 kg/m³ of material weight,
- Number of revolutions approx. 36 U/min (prm),
- 2 x Inlet,
- 1 x Outlet,
- 3 x inspection cover,
- Additional Hardox coat (layer) in the trough,
- Hardox Screw flight,
- without rotation control sensor,
- without support,
- a set of bearings,
- Color: RAL,
- according to customers drawing.
- IE4 engine

Stack

1No 12m high x 800mm I/D single-flue stack that is to be self-supporting and ground mounted. Design to BS4076: 1989 and/or the C.I.C.I.N.D. Model Code for Steel Chimneys with 1.5mm corrosion allowance and to suit a maximum flue gas temperature of 40°C.
 Stack from 6mm thick S275 carbon steel and constructed in 1No integral section.
 1No rectangular inlet branch (say 1100mm high x 500mm wide) c/w flange to receive your flue ducting.
 Base plate assembly c/w earth lugs for others to connect an earth system.
 Template and holding down bolts. (Bolt cage).
 Cope band at stack top.
 Blank off plate c/w 2" N.B. drain point for piping away by others.
 2No emission test points.
 1No row of ladder bosses to facilitate steeplejack access ladders for future maintenance.
 Internal stack surfaces not treated and left self-colour.
 External stack surfaces blast clean to SA2.5 and treated with system D6 (or equal) comprising Epigrip C400V3 Epoxy Primer/Buildcoat at 200 microns (nom') dft followed by C750V2 Special Finish at 75 microns (nom') dft. To be to an agreed RAL colour but excluding RAL 9006 and RAL 9007.
 100% visual inspection of welds and lifting lugs dye' penetrant tested.
 Structural design calculations.
 Fabrication drawings.
 Quality Plan. (If required).
 O&M Manual. (If required).
 AP visit and preparation of RAMS to include lifting plan.

Sampling platform

2No (80mm N.B.?) sampling points located at 90° to one another and we assume these will be no higher than 8m agl.
 1x 4m long x 2m wide rectangular sampling platform in accordance with Figure A2.2 of the Environment Agency document Technical Guidance Note (Monitoring) M1. We also include a caged access ladder to BS4211 from ground level up to the platform and the ladder and platform will be hot dip galvanised after fabrication to BS EN ISO 1461.

4.3 MECHANICAL INSTALLATION

Quantity: 1 set of installation

To be carried out during a single, continuous visit during normal working hours. Additional costs will be charged should our installation team being delayed due to matters beyond our control. Please note our exclusions for details of services that may be required for our installation staff to carry out the installation.

4.4 COMMISSIONING + TRAINING

Quantity: 1 set

Test run and warm commissioning as well as training of operation personnel by one technician.

Price includes 1 man day + one trip to and from customer's premises.

4.5 ENGINEERING

Quantity: 1 set

for above listed items as follows

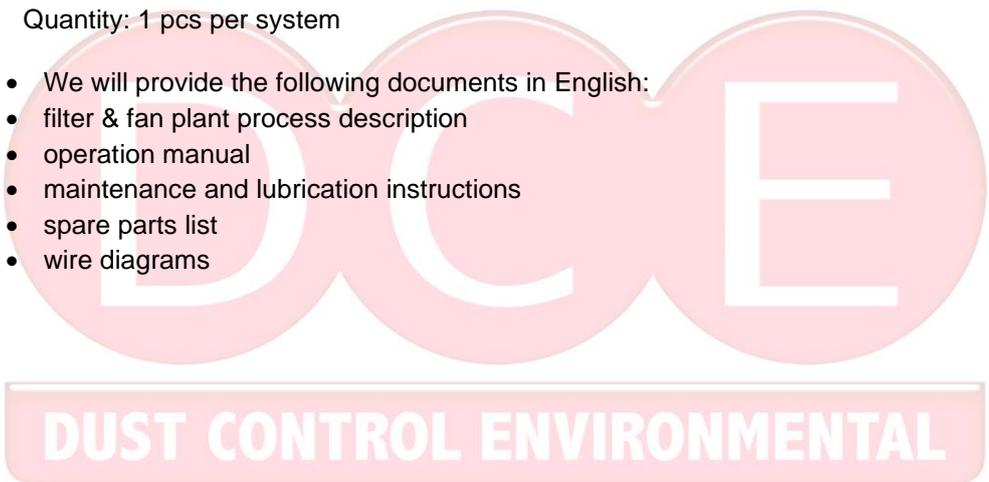
Mechanical Engineering

- overall project management for the listed scope of supply preparation of drawings
- preparation of filter layout drawing and foundation drawing preparation of layouts
- preparation of manufacturing drawings
- preparation of assembly drawings

4.6 DOCUMENTATION

Quantity: 1 pcs per system

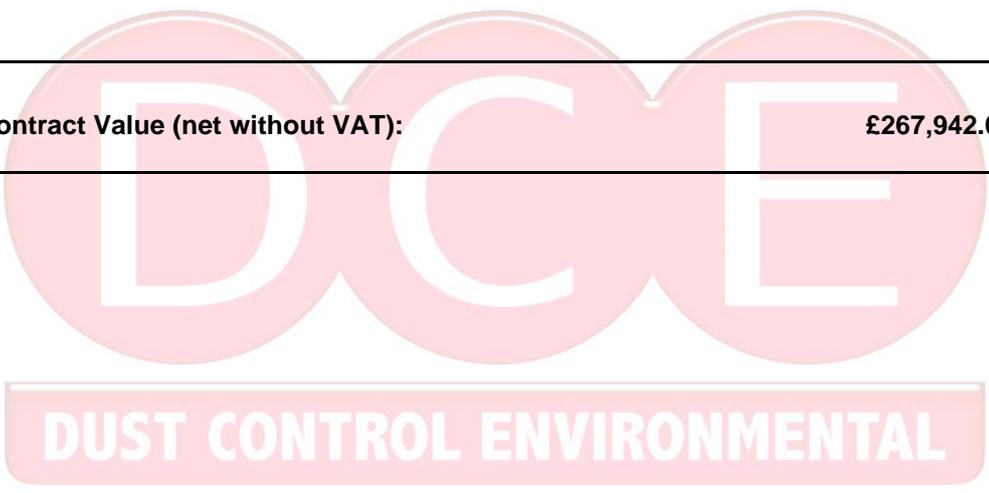
- We will provide the following documents in English:
- filter & fan plant process description
- operation manual
- maintenance and lubrication instructions
- spare parts list
- wire diagrams



DUST CONTROL ENVIRONMENTAL

5 PRICE COMPILATION

Item	Qty.	Designation	Total
	1	DCE ENVIROJET FILTER	£146,270.00
	1	FAN SET AND ATTENUATION	
	1	DISCHARGE STACK	£55,384.00
	1	SCREW CONVEYOR	£16,800.00
	1	FILTER MONITOR	£20,167.00
	1	ROTARY VALVE	£15,098.00
	1	DUCTWORK	
	1	CONTROL PANEL	
	1	DELIVERY	
	1	INSTALLATION SUPERVISION	£11,923.00
	1	COMMISSIONING & TRAINING	
	1	DRAWING WORK	£ 2,300.00
<hr/> Total contract Value (net without VAT):			£267,942.00

A large, semi-transparent version of the DCE logo is centered on the page. It consists of the letters 'DCE' in white inside three overlapping red circles, with the text 'DUST CONTROL ENVIRONMENTAL' in white on a red rectangular background below it.

DUST CONTROL ENVIRONMENTAL

6 TERMS OF PAYMENT / DELIVERY

Payment:

20% +VAT, due with order to be paid within 7 days of invoice
10% due on receipt of drawings for approval
60% +VAT, due upon readiness of shipment or delivery
10% +VAT, due upon completion of commissioning, 4 weeks after delivery at the latest

Terms of payment:

All prices are subject to VAT at 20%

Quotation validity:

30 days from date of quotation

Delivery time:

12-14 weeks from written order placement and completed technical and commercial clarification (with regard to the main components)

- Prices are based on the current calculation base. DCE reserves the right to pass price changes on to the buyer up to the point when an order is placed. In particular, in the event of changes in the commercial or technical aspects of the stipulated parameters.
- DCE reserves the right to implement changes in the design within the course of process and design in the sense of further technical development and/or improvement of the system and parts thereof, insofar as these do not influence the scope of deliveries and services.
- The illustrations in this quotation are exemplary and do not necessarily represent the system components quoted. The dimensions stipulated in the item text are guide values and shall not be considered binding.

7 SCHEDULE

- To be discussed prior to order placement.

8 GENERAL TERMS & CONDITIONS

- Unless other conditions are expressly cited in the seller's quotation, the sales terms and conditions of the seller and the delivery and installation terms and conditions of the seller's mechanical engineering and steel construction industry trade association shall apply.
- The goods remain the seller's property until full payment has been made, also with respect to third parties.
- If there are any delays in installation, commissioning, maintenance, repair, or any other service, which are based on causes that are out of the seller's sphere of influence, the buyer shall be liable for all occurring cost, particularly due to waiting times or additional travelling and expenses of the seller's employees or subcontractors hired by the seller.
- Place of jurisdiction is that of the registered office of the seller. The national laws of the seller shall apply. However, the seller also has the right to initiate proceedings at the court having general jurisdiction at the registered office of the contractual partner.
- The liability for damages resulting from product liability law, and any product liability claims that could be derived from other regulations shall be governed by statutory national provisions of the supplier. Passing on to third parties is not permitted.

9 GENERAL WARRANTY

Prerequisite for a warranty claim is that the maintenance and operating instructions have been complied with and that the system components delivered by the seller have been operated in accordance with the basic parameters specified, whilst taking into account all of the points listed.

- The seller guarantees a professional manufacturing of the mechanical system components delivered by the seller. The period of warranty extends to 12 months after mechanical completion or commissioning, however, not more than 15 months after notification of readiness for shipping.
- The period of the warranty for electrical system components provided by the seller extends to 12 months after commissioning, according to directives of the electrical industry.
- In warranty cases, the seller provides free replacements for parts supplied by the seller (spare parts) and which are not subject to natural wear and tear (wear parts).
- If defective parts (which can be verified as being covered by the warranty) are replaced within the period of warranty, the period of warranty shall be extended one time only by 6 months for the parts replaced. The period of warranty remains unaffected for the parts that were not replaced.
- In the event of material defects, these must be reported to the seller immediately and a reasonable time for inspection and repair must be granted.

Cont...

- The warranty for the filter media amounts to max. 4.000 operating hours or 12 months after commissioning.
- 5% of the damaged media is considered normal wear. If the stipulated warranty period is not reached, a proportional reimbursement for the damaged filter medium for the months remaining until the end of the warranty period will be offset against the price of the filter medium.
- If gas or vapor-forming compounds are present in the raw gas, and which were not stated in the raw gas specification, these contaminants may pass through the filter or irreversibly increase the through-flow resistance of the filter medium. These operating conditions as well as damage to the filter medium represent improper use and are thus excluded from the warranty. An extension of the warranty for filter media is excluded.
- A warranty claim with regard to filter media is dependent on the expert report from a filter media manufacturer.
- No compensation will be paid for consequential damage or cost for breaks in operation (lost profit).

a. Emission Warranty

- The maximum emission from the aforementioned Tornado Downflow filter will not exceed 3mg/m³, this is based on normal filter & operational running condition which conforms to the original design specification mentioned earlier within this quotation, and that the plant is operated within the parameters of the O&M provided.

b. Noise Warranty

- If noise protection or noise reduction measures are prescribed by the authorities, these shall not constitute a basis for retrospective warranty or guarantee claims with regard to noise level reduction.

c. Warranty Exceptions

9

- Unauthorized alterations legally absolve the seller of any liability and warranty claims along with any resultant consequences.
- Faults arising due to incorrect assembly not carried out by the seller and without consultation with the seller for the adjustment, commissioning and any measurement necessary.
- Provision of goods and services by the buyer that have been improperly executed.
- Inadequate or improper storage of system components.

- Operational procedures and sequences of events in the case of faults that do not comply with the seller's electrical system procedures or which are not identified in good time.
- Unauthorized access by third parties.
- Extended duration of faults and operational shutdowns.
- Use of operating materials that are not stated in the operating instructions for the machine.
- Changes in chemical conditions, temperature, dropping below dew-point, the appearance of condensate, flying sparks, auto-ignition, fire, extinguishing solvents, explosions and implosions and consequential damages resulting from these.
- System corrosion due to substances that are not stated in the basic data.
- Temperatures dropping below dew-point of water and acids, due to changes in the operational data and basic data.
- Damage to system components due to fire and smoldering fire, flying sparks, caused by exhaust gas values that do not comply with the emissions provisions.



d. Not Included in Scope of Supply - General

All work and services that are not expressly stipulated in this quotation, such as the following points for example:

- Offloading & assembly equipment (ie crane/lifting device)
- MEWP for safe installation of the ductwork system
- On site electrical wiring and labour to connect the starting panel to all electrical motors/devices
- Compressed air connection from a suitable mains
- Short-term storage of the system components in a dry location, protected from theft.
- All necessary structural work such as: Foundations, earthworks, cutting work, plastering work, painting work, and surface coating as well as making breakthroughs in walls and ceilings incl. the resealing and insulating of these afterwards.
- System lighting, all platforms, ladders, steps and access ways in existing buildings.
- Structural calculations for the mounting of the pipework and the erection of components in existing buildings and subsections.
- Structural calculations in the event of deviations from the standard dimensions of steel components quoted.
- Bolt connection and sealing material at the supply boundaries.
- Collision protection required for the steel components.
- Electrical installation work such as wiring of individual consumers and power supply to the electrical control cabinet incl. installation and wiring of the local switch cabinets.
- If necessary, extinguishing water and dry-extinguishing pipework for the seller's system components, distance 5 meters from the filter.
- If necessary, lightning protection and earthing devices incl. the attachment of earth connections to the system or system components.

APPENDIX 2

Dusthunter SP100 dust monitoring probe brochure



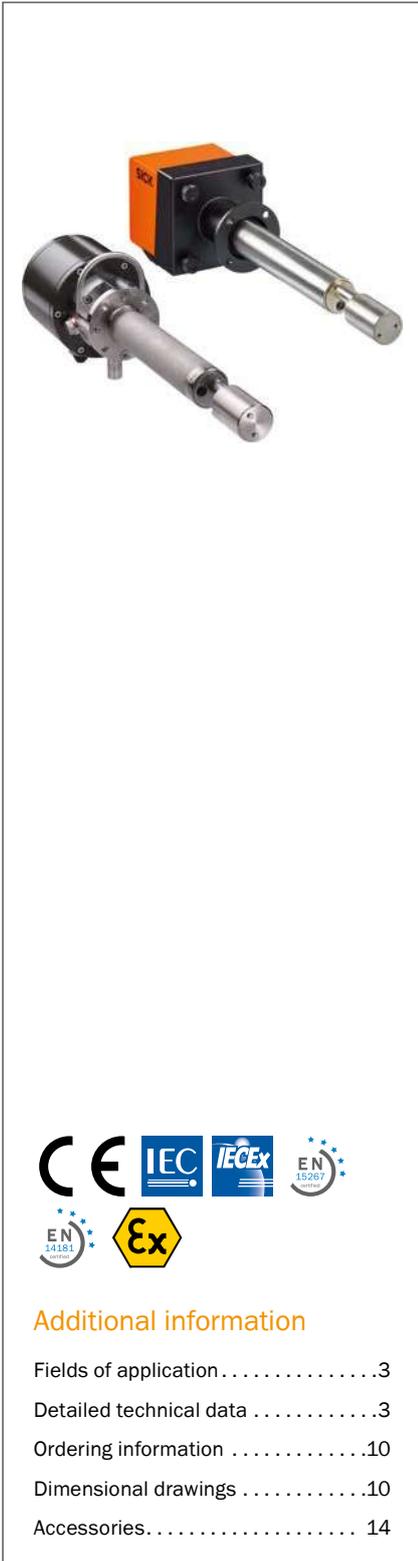
DUSTHUNTER SP100

PROBE DESIGN WITH FORWARD
SCATTERED LIGHT MEASUREMENT

Scattered light dust measuring devices

SICK
Sensor Intelligence.

PROBE DESIGN WITH FORWARD SCATTERED LIGHT MEASUREMENT



Product description

The DUSTHUNTER SP100 is a type-approved measuring device with probe for very low to medium dust concentrations. Installation from one side makes it ideal for thick-walled or double-walled ducts.

The measurement is based on the forward scattering of light. An automated check of the zero and reference point as well as a contamination check are on board in the device.

At a glance

- Installation from one side
- For very low to medium dust concentrations
- Automated check of zero and reference point
- Contamination check
- Hastelloy measuring probe available for corrosive gases
- For small to medium duct diameters
- Device version for explosive zone 2/22 or 1/21

Your benefits

- Ideal for thick- or double-walled ducts
- Approved according to EN 15267
- Low maintenance due to self-monitoring and contamination check
- Quick installation – no alignment required



Additional information

Fields of application 3
 Detailed technical data 3
 Ordering information 10
 Dimensional drawings 10
 Accessories 14

→ www.sick.com/DUSTHUNTER_SP100

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Fields of application

- Emissions monitoring at power plants and waste incineration plants
- Monitoring of filter systems
- Measurements in exhaust gas or exhaust ventilation ducts

Detailed technical data

The exact device specifications and performance data of the product may deviate from the information provided here, and depend on the application in which the product is being used and the relevant customer specifications.

DUSTHUNTER SP100 system

Measured values	Scattered light intensity, dust concentration (after gravimetric comparison measurement)
Performance-tested measurands	Scattered light intensity
Measurement principles	Scattered light forward
Spectral range	640 nm ... 660 nm Laser, protection class 2, power < 1 mW
Measuring ranges	Dust concentration 0 ... 5 mg/m ³ / 0 ... 500 mg/m ³ Higher measuring ranges on request
Certified measuring ranges	Dust concentration 0 ... 7.5 mg/m ³ / 0 ... 10 mg/m ³ / 0 ... 15 mg/m ³ / 0 ... 50 mg/m ³ / 0 ... 100 mg/m ³ / 0 ... 200 mg/m ³ / 0 ... 500 mg/m ³
Response time (t₉₀)	1 s ... 600 s Freely adjustable
Accuracy	≤ 2 % of measuring range full scale
Duct diameter	≥ 0.25 m
Conformities	Approved for plants requiring approval 2001/80/EC (13. BImSchV) 2000/76/EC (17. BImSchV) 27. BImSchV TA-Luft (Prevention of Air Pollution) EN 15267 EN 14181 MCERTS 2010/75/EU U.S. EPA PS-11 compliant
Electrical safety	CE
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test with reference filter

DUSTHUNTER SP100 Ex-2K system

Measured values	Scattered light intensity, dust concentration (after gravimetric comparison measurement)
Performance-tested measurands	Scattered light intensity
Measurement principles	Scattered light forward
Spectral range	640 nm ... 660 nm Laser, protection class 2, power < 1 mW
Measuring ranges	Dust concentration 0 ... 5 mg/m ³ / 0 ... 500 mg/m ³ Higher measuring ranges on request
Certified measuring ranges	Dust concentration 0 ... 7.5 mg/m ³ / 0 ... 10 mg/m ³ / 0 ... 15 mg/m ³ / 0 ... 50 mg/m ³ / 0 ... 100 mg/m ³ / 0 ... 200 mg/m ³ / 0 ... 500 mg/m ³
Response time (t₉₀)	1 s ... 600 s Freely adjustable
Accuracy	≤ 2 % of measuring range full scale

Conformities	Approved for plants requiring approval 2001/80/EC (13. BImSchV) 2000/76/EC (17. BImSchV) 2010/75/EU 27. BImSchV TA-Luft (Prevention of Air Pollution) EN 15267 EN 14181 U.S. EPA PS-11 compliant
Electrical safety	CE
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test with reference filter

DUSTHUNTER SP100 Ex-3K system

Measured values	Scattered light intensity, dust concentration (after gravimetric comparison measurement)
Performance-tested measurands	Scattered light intensity
Measurement principles	Scattered light forward
Spectral range	640 nm ... 660 nm Laser, protection class 2, power < 1 mW
Measuring ranges	Dust concentration 0 ... 5 mg/m ³ / 0 ... 500 mg/m ³ Higher measuring ranges on request
Certified measuring ranges	Dust concentration 0 ... 7.5 mg/m ³ / 0 ... 10 mg/m ³ / 0 ... 15 mg/m ³ / 0 ... 50 mg/m ³ / 0 ... 100 mg/m ³ / 0 ... 200 mg/m ³ / 0 ... 500 mg/m ³
Response time (t₉₀)	1 s ... 600 s Freely adjustable
Accuracy	≤ 2 % of measuring range full scale
Conformities	Approved for plants requiring approval 2001/80/EC (13. BImSchV) 2000/76/EC (17. BImSchV) 27. BImSchV TA-Luft (Prevention of Air Pollution) EN 15267 EN 14181 2010/75/EU U.S. EPA PS-11 compliant
Electrical safety	CE
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test with reference filter

DHSP-Txxx sender/receiver unit

Process temperature		
Standard version DHSP-T2xx:		-40 °C ... +220 °C
High temperature version DHSP-T2xx:		-40 °C ... +400 °C
Process pressure		
With MCU-P control unit:		-50 hPa ... 10 hPa
With external purge air unit:		-50 hPa ... 30 hPa
With instrument air (provided by the customer):		-100 hPa ... 100 hPa
Process gas humidity		Non-condensing
Ambient temperature		-40 °C ... +60 °C
Electrical safety		CE
Enclosure rating		IP66
Dimensions (W x H x D)		Dimensions may vary. For details, see the dimensional drawings.
Weight		
Nominal length 435 mm:		≤ 6,5 kg
Nominal length 735 mm:		≤ 7,8 kg
Nominal length 1,035 mm:		≤ 9,5 kg
Nominal length 1,335 mm:		≤ 11 kg
Power supply		
Voltage	24 V DC	
Voltage	Supply via control unit	
Power consumption	≤ 4 W	

DHSP-Txxxx1EX2K sender/receiver unit

Process temperature		
DHSP-T2xxx1EX2K standard version:		-40 °C ... +220 °C
DHSP-T4xxx1EX2K high-temperature version:		-40 °C ... +400 °C
Process pressure		
With instrument air (provided by customer):		0 hPa ... 3,000 hPa Absolute pressure
Process gas humidity		Non-condensing
Duct diameter		≥ 0,25 m
Ambient temperature		-40 °C ... +60 °C
Ex-approvals		
IECEX		Ex db op is IIC T6 Gb Ex tb op is IIIC T85°C Db
ATEX		Ex II 2G Ex db op is IIC T6 Gb Ex II 2D Ex tb op is IIIC T85°C Db
Electrical safety		CE, Protection class III
Enclosure rating		IP66
Dimensions (W x H x D)		Dimensions may vary. For details, see the dimensional drawings.
Weight		
Nominal length 435 mm:		≤ 14 kg
Nominal length 735 mm:		≤ 15,3 kg

Power supply	Voltage	24 V DC
	Voltage	Supply via control unit
	Power consumption	≤ 8 W

DHSP-Txxxx1EX3K sender/receiver unit

Process temperature		
	DHSP-T2xxx1EX3K standard version:	-15 °C ... +220 °C
	DHSP-T4xxx1EX3K high-temperature version:	-15 °C ... +400 °C
Process pressure		
	With instrument air (provided by customer):	-100 hPa ... 100 hPa
Process gas humidity		Non-condensing
Duct diameter		≥ 0.25 m
Ambient temperature		-15 °C ... +60 °C
Ex-approvals		
	ATEX	Ex II 3G Ex nR op is IIC T6 Gc Ex II 3D Ex tc op is IIIC T85°C Dc
Electrical safety		CE, Protection class III
Enclosure rating		IP66
Dimensions (W x H x D)		Dimensions may vary. For details, see the dimensional drawings.
Weight		
	Nominal length 435 mm:	≤ 13.5 kg
	Nominal length 735 mm:	≤ 14.8 kg
Power supply		
	Voltage	24 V DC
	Voltage	Supply via control unit
	Power consumption	≤ 4 W

MCU-N control unit

Description		Unit to control the system components and to evaluate and output the data provided by them
Ambient temperature		-40 °C ... +60 °C
Electrical safety		CE, Protection class I
Enclosure rating		IP66
Analog outputs		1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; two additional outputs if using I/O modules (option)
Analog inputs		2 inputs: 0 ... 20 mA, 110 Ω Not electrically isolated; two additional inputs if using I/O modules (option)
Digital outputs		5 relay contacts: 48 V, 1 A Potential-free; for status signals
Digital inputs		4 potential-free contacts
Modbus		✓
	Type of fieldbus integration	TCP (via optional interface module, only one module possible per MCU) RTU RS-485 (via optional interface module, only one module possible per MCU)
PROFIBUS DP		✓
	Type of fieldbus integration	Via optional interface module (only one module possible per MCU)
Ethernet		✓
	Type of fieldbus integration	Via optional interface module (only one module possible per MCU)
	Function	Connection to SOPAS ET software or OPC server

Indication	LC display Status LEDs: "Power," "Failure," and "Maintenance request"								
Operation	Via LC-display or software SOPAS ET								
Dimensions (W x H x D)	210 mm x 340 mm x 120 mm (for details see dimensional drawings)								
Weight	≤ 3.7 kg								
Power supply	<table border="0"> <tr> <td style="padding-right: 20px;">Voltage</td> <td>90 V AC ... 250 V AC</td> </tr> <tr> <td>Voltage</td> <td>Version with 24 V DC available as an option</td> </tr> <tr> <td>Frequency</td> <td>47 ... 63 Hz</td> </tr> <tr> <td>Power consumption</td> <td>≤ 50 VA</td> </tr> </table>	Voltage	90 V AC ... 250 V AC	Voltage	Version with 24 V DC available as an option	Frequency	47 ... 63 Hz	Power consumption	≤ 50 VA
Voltage	90 V AC ... 250 V AC								
Voltage	Version with 24 V DC available as an option								
Frequency	47 ... 63 Hz								
Power consumption	≤ 50 VA								
Options	Interface module(s) I/O module(s)								

MCU-P control unit

Description	Unit to control the system components and to evaluate and output the data provided by them. With integrated purge air unit.
Gas flow rate	≤ 20 m ³ /h
Ambient temperature	-40 °C ... +45 °C Intake temperatures for purge air
Electrical safety	CE, Protection class I
Enclosure rating	IP66
Analog outputs	1 output: 0/2/4 ... 20 mA, + 750 Ω Electrically isolated; two additional outputs if using I/O modules (option)
Analog inputs	2 inputs: 0 ... 20 mA, 110 Ω Not electrically isolated; two additional inputs if using I/O modules (option)
Digital outputs	5 relay contacts: 48 V, 1 A Potential-free; for status signals
Digital inputs	4 potential-free contacts
Modbus	✓
Type of fieldbus integration	TCP (via optional interface module, only one module possible per MCU) RTU RS-485 (via optional interface module, only one module possible per MCU)
PROFIBUS DP	✓
Type of fieldbus integration	Via optional interface module (only one module possible per MCU)
Ethernet	✓
Type of fieldbus integration	Via optional interface module (only one module possible per MCU)
Function	Connection to SOPAS ET software or OPC server
Indication	LC display Status LEDs: "Power," "Failure," and "Maintenance request"
Operation	Via LC-display or software SOPAS ET
Dimensions (W x H x D)	300 mm x 455 mm x 220 mm (for details see dimensional drawings)
Weight	≤ 13.5 kg

Power supply	Voltage	90 V AC ... 250 V AC
	Voltage	Version with 24 V DC available as an option
	Frequency	47 ... 63 Hz
	Power consumption	≤ 70 VA
Options		Interface module(s) I/O module(s)

MCUDH Ex-3K control unit

Description		Unit to control the system components and to evaluate and output the data provided by them
Ambient temperature		
	With integrated power supply unit:	-25 °C ... +50 °C
	With external 24 V supply:	-40 °C ... +60 °C
Ex-approvals	ATEX	With integrated power supply unit Ex II 3G Ex ec nA nC IIC T4 Gc Ex II 3D Ex tc IIIC T85°C Dc Ex II 3G Ex ec IIC T4 Gc Ex II 3D Ex tc IIIC T85°C Dc
Electrical safety		CE, Protection class I (with integrated power supply unit), Protection class III (without integrated power supply unit)
Enclosure rating		IP65
Analog outputs		1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated
Analog inputs		2 inputs: 0 ... 20 mA, 110 Ω Not electrically isolated
Digital outputs		5 relay contacts: 48 V, 1 A Potential-free; for status signals
Digital inputs		4 potential-free contacts
Modbus	Type of fieldbus integration	✓ RTU RS-485 (via optional interface module, Only one module possible per MCU. Other interfaces are possible outside explosive zones using an external connection module.)
Indication		LC display
Operation		Via LC-display or software SOPAS ET
Dimensions (W x H x D)		300 mm x 300 mm x 220 mm (for details see dimensional drawings)
Weight		≤ 8.8 kg
Power supply		
	Voltage	90 V AC ... 250 V AC
	Voltage	Type with external 24 V supply optionally available
	Frequency	47 ... 63 Hz
	Power consumption	≤ 50 VA

SLV4-2 purge air unit, 2BH1300, 3-ph

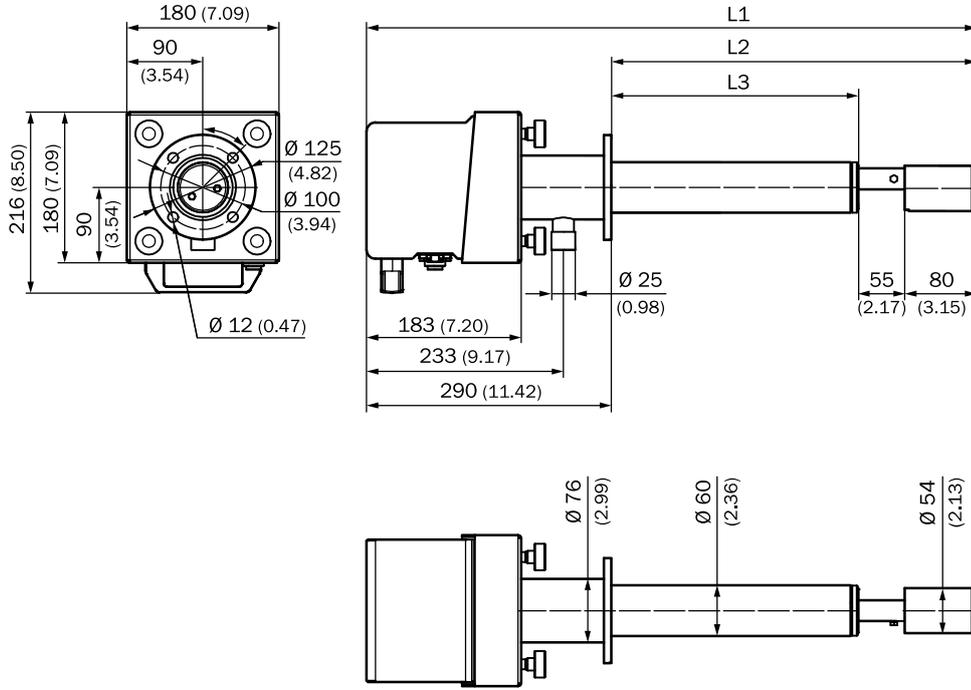
Description	Unit to provide dust-free air for flushing of optical surfaces
Gas flow rate	38 m ³ /h ... 63 m ³ /h At 30 hPa counter pressure, depending on low pressure inside the filter
Ambient temperature	-40 °C ... +55 °C
Electrical safety	CE
Enclosure rating	IP54
Dimensions (W x H x D)	550 mm x 550 mm x 257 mm (for details see dimensional drawings)
Weight	18 kg
Power supply	Three-phase current
	Δ: 200 ... 240 V, 50 Hz, 2,6 A, 400 W Y: 345 ... 415 V, 50 Hz, 1,5 A, 400 W Δ: 200 ... 275 V, 60 Hz, 2,6 A, 500 W Y: 380 ... 480 V, 60 Hz, 1,5 A, 500 W Δ: 270 ... 330 V, 50 Hz, 2,0 A, 400 W Y: 465 ... 570 V, 50 Hz, 1,16 A, 400 W Δ: 290 ... 360 V, 60 Hz, 2,1 A, 500 W Y: 500 ... 600 V, 60 Hz, 1,26 A, 500 W Δ: 230 V, 50 Hz, 2,7 A, 370 W Δ: 115 V, 60 Hz, 3,0 A, 450 W Δ: 220 ... 270 V, 50 Hz, 2,5 A, 400 W Y: 380 ... 465 V, 50 Hz, 1,45 A, 400 W Δ: 240 ... 290 V, 60 Hz, 2,6 A, 500 W Y: 415 ... 500 V, 60 Hz, 1,55 A, 500 W
Auxiliary gas connections	Purge air
	40 mm
Test functions	Pressure switch (switching point -35 hPa)
Integrated components	2-step air filter, type Europiclone, dust capacity 200 g

Ordering information

Our regional sales organization will help you to select the optimum device configuration.

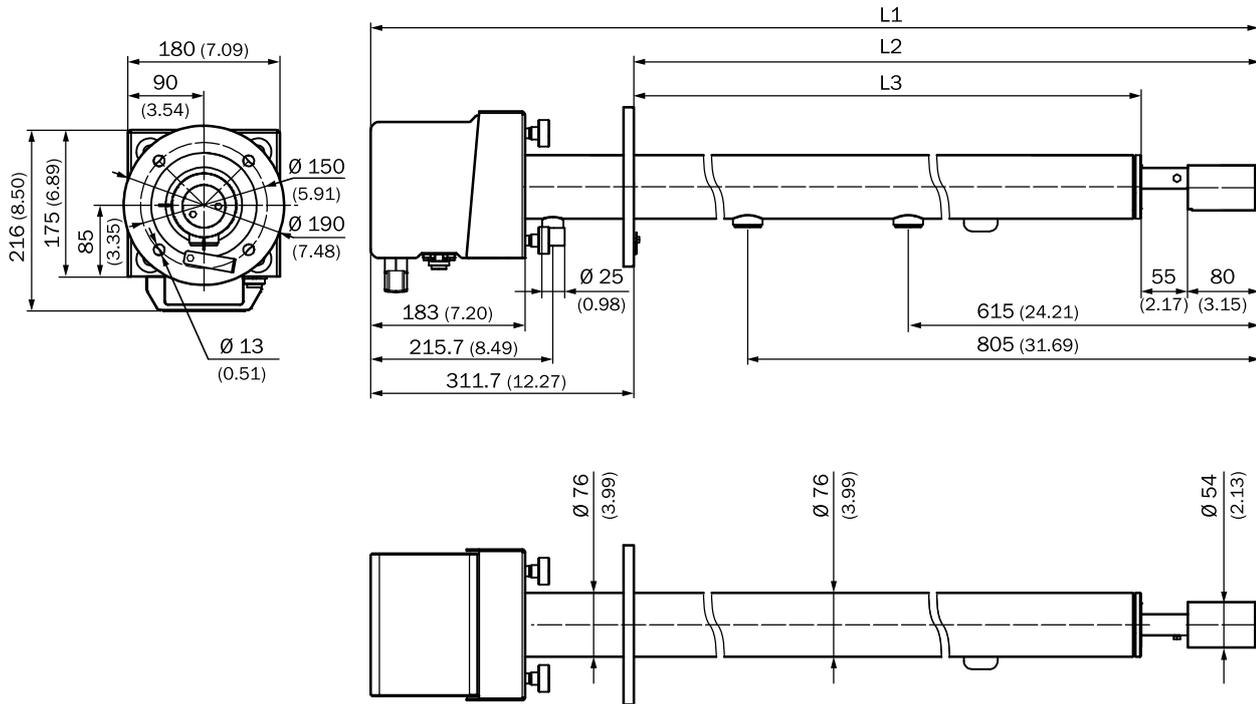
Dimensional drawings (Dimensions in mm (inch))

DHSP-Txx1/-Txx2 sender/receiver unit



Sender/receiver unit Type	L1	Nominal length of the probe L2	L3
DHSP-Txx1	725	435	300
DHSP-Txx2	1,025	735	600
All dimensions in mm			

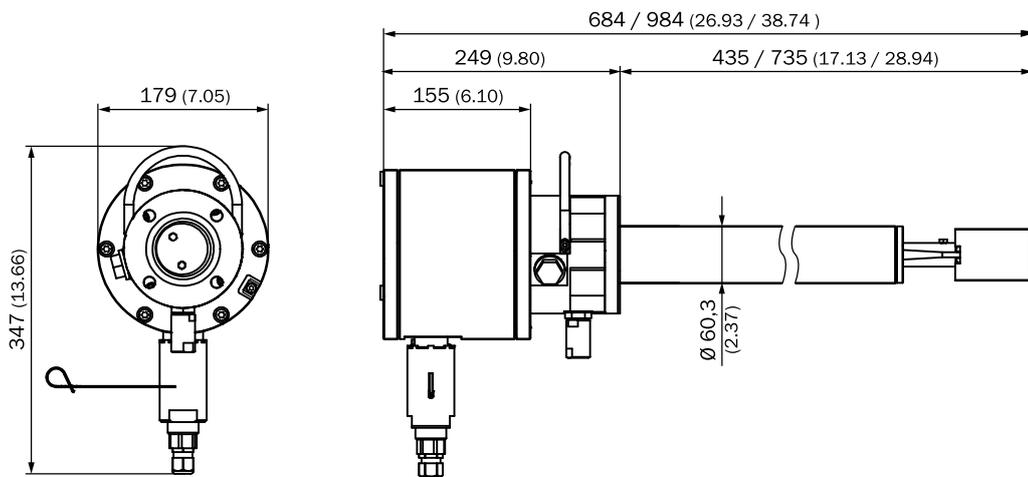
DHSP-Txx3/-Txx4/-Txx5/-Txx6/-Txx7 sender/receiver unit



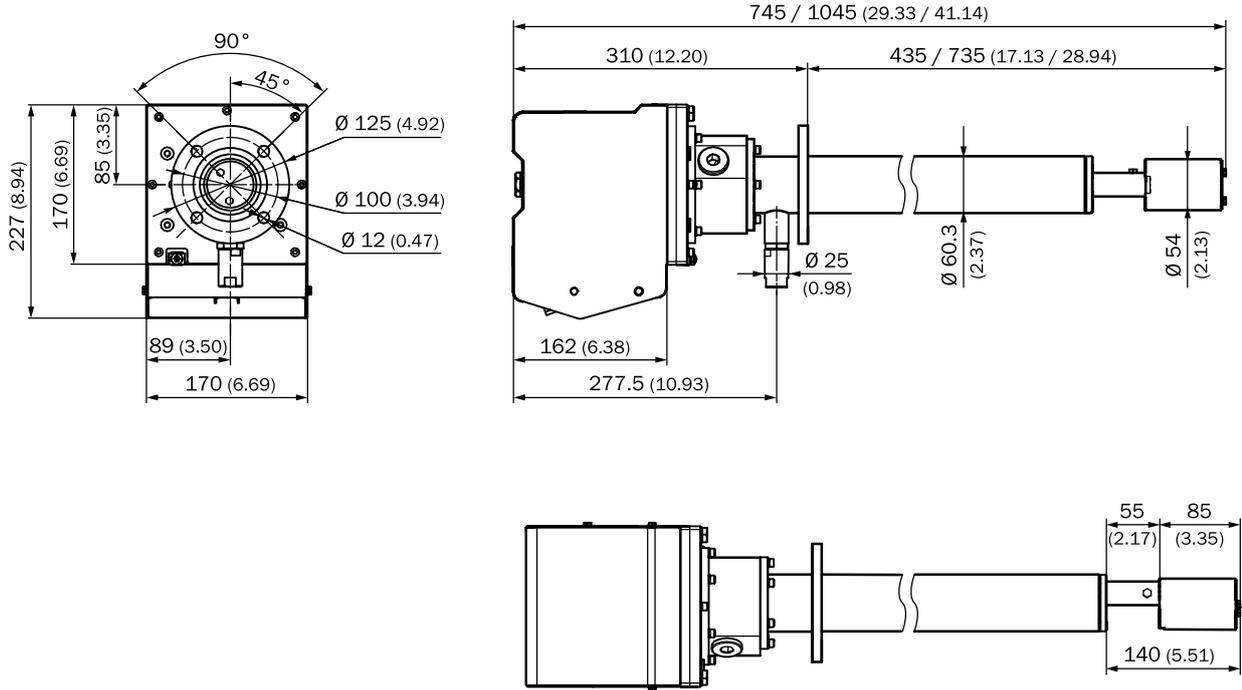
Sender/receiver unit Type	L1	Nominal length of the probe L2	L3
DHSP-Txx3	1,347	1,035	900
DHSP-Txx4	1,647	1,335	1,200
DHSP-Txx5	1,947	1,635	1,500
DHSP-Txx6	2,147	1,835	1,700
DHSP-Txx7	2,397	2,085	1,950

All dimensions in mm

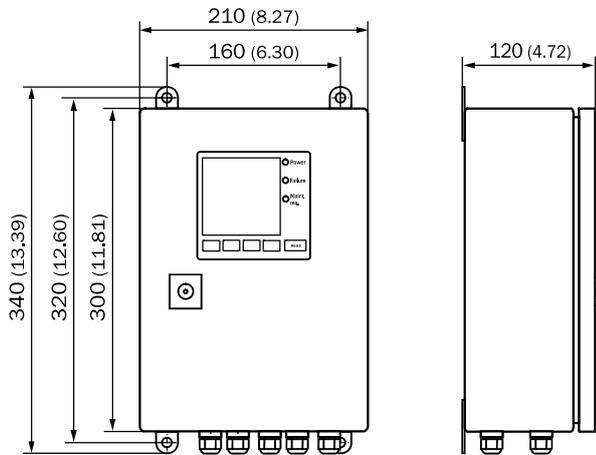
DHSP-Txxxx1EX2KT6 sender/receiver unit



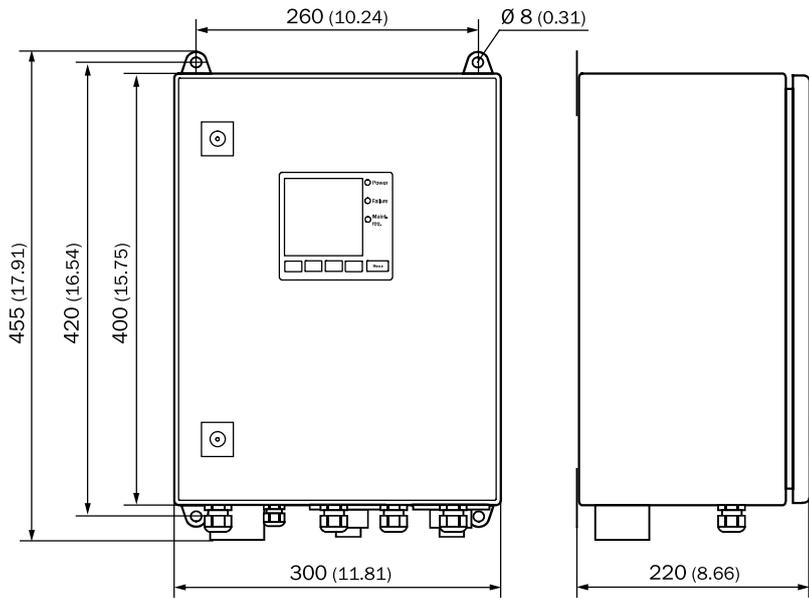
DHSP-Txxxx1EX3K sender/receiver unit



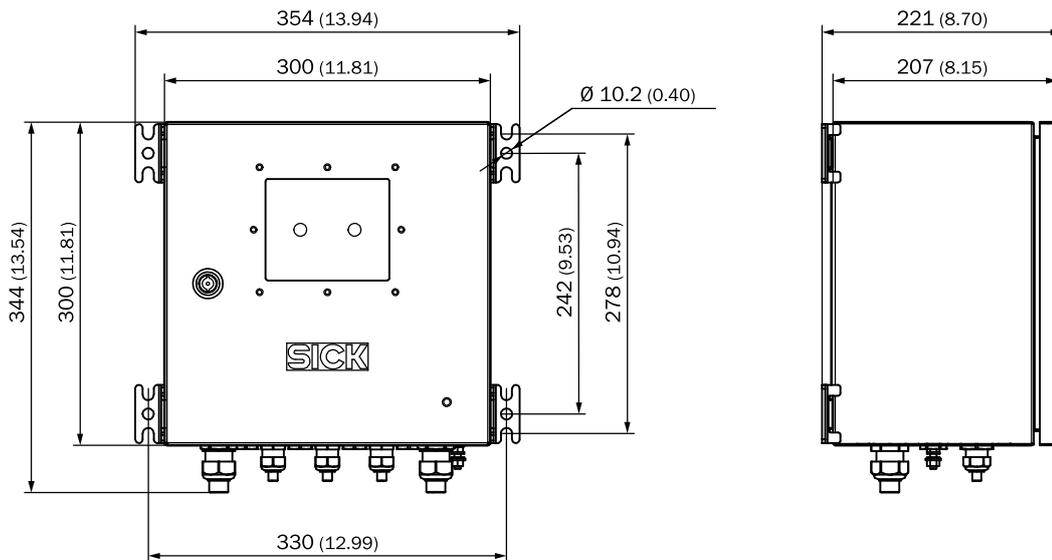
MCU-N control unit; wall-mounting enclosure, compact version (for non-hazardous areas only)



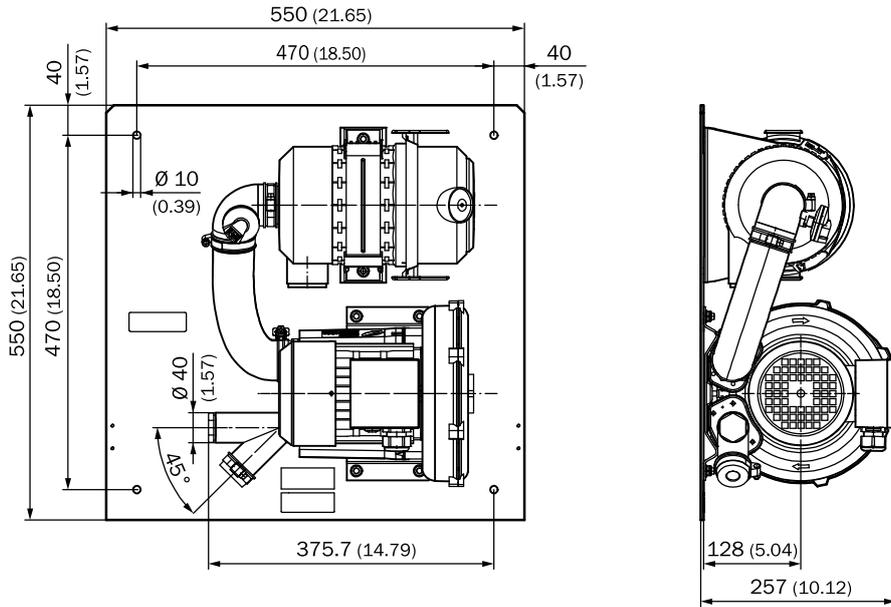
MCU-P control unit; wall-mounting enclosure, compact version (for non-hazardous areas only)



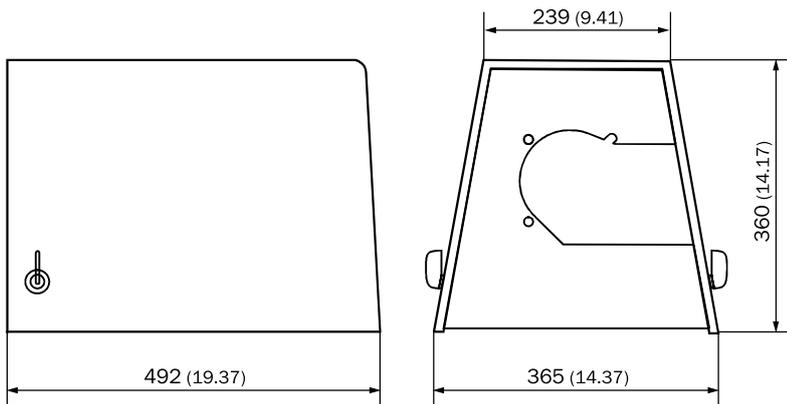
MCUDH Ex-3K control unit



SLV4-2 purge air unit, 2BH1300



Weather protection cover for sender/receiver unit DHSP-Txx3/-Txx4/-Txx5/-Txx6/-Txx7



Accessories

Optics cloths

Brief description	Part no.
Cloth for cleaning optical surfaces	4003353

Test and monitoring tools

Brief description	Part no.
Control filter set comprises: filter with approx. 0%, 18%, 40%, 60%, 80% transmission, filter holder, lens cloth, case with insert	2049045

Sets and kits

Brief description	Part no.
DR290 replacement set consisting of: 1.4571 steel blind flange, flat seal, distance sleeves, nuts and washers, small spare parts kit, information document	2085134
OMD41 replacement set consisting of: 1.4571 steel blind flange, flat seal, distance sleeves, nuts and washers, small spare parts kit, information document	2085136

Brief description	Part no.
Replacement set RM41 consisting of: Adapter flange steel 1.0037, adapter plate, sealings, nuts and washers, information document	2089509
RM41 replacement set consisting of: 1.0254 steel adapter flange, blind flange, flat seal, distance sleeves, nuts and washers, small spare parts kit, information document	2085132
RM41 replacement set consisting of: 1.4571 steel adapter flange, blind flange, flat seal, distance sleeves, nuts and washers, small spare parts kit, information document	2085131
Mounting kit consisting of: nuts, washers	2018184
	2076717
Sopas Service Kit consisting of: RS485 adapter, USB 2.0 cable, connection cable	2097408

Device protection (mechanical)

Protective housings and protective pipes

Brief description	Part no.
Weather proof cover, Aluminum, painted	2702407
Weather proof cover for Dusthunter with nominal length > 735 mm, Aluminum, painted	7047582
Weather hood for analyzer, stainless steel 1.4301	2047253
Weather proof cover for external blower unit, Aluminum, painted	2084180

Flanges

Weld-in flange

Brief description	Pitch circle diameter	Thread size	Part no.
Flange with tube, inner diameter 125 mm, nominal length 800 mm, Structural steel 1.0037	150 mm	M12	7047580
Flange with tube, inner diameter 70.2 mm, nominal length 500 mm, Stainless steel 1.4571	100 mm	M10	2017850
Flange with tube, inner diameter 70.2 mm, nominal length 130 mm, Stainless steel 1.4571	100 mm	M10	2017846
Flange with tube, inner diameter 70.2 mm, nominal length 130 mm, 1.0254	100 mm	M10	2017845
Flange with tube, inner diameter 70.2 mm, nominal length 240 mm, Stainless steel 1.4571	100 mm	M10	2017848
Flange with tube, inner diameter 70 mm, nominal length 500 mm, Structural steel 1.0037	100 mm	M10	2076714
Flange with tube, inner diameter 123 mm, nominal length 1,100 mm, Structural steel 1.0037	150 mm	M12	7047581
Flange with tube, inner diameter 70.2 mm, nominal length 500 mm, 1.0254	100 mm	M10	2017849
Flange with tube, inner diameter 70.2 mm, nominal length 240 mm, 1.0254	100 mm	M10	2017847

Plug connectors and cables

Connecting cables

Brief description	Part no.
Connection cable for optional I/O module, for connecting several modules	2040977
Connection cable, slave, for connection of S/E units, 5-wire, 10 m	7042018
Connection cable, slave, for connection of S/E units, 5-wire, 5 m	7042017

Other connectors and cables

Brief description	Part no.
CAN extension cable, 6-wire, 15 m	2020439
CAN extension cable, 6-wire, 5 m	2020437
CAN extension cable, 6-wire, 10 m	2020438
CAN bus cable, 6-wire, 12 m	2020861

SICK AT A GLANCE

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