Customer:	**PETROTEL LUKOIL SA**
Equipment Description:	**6” MK IV KS Coalescent Type Cyclone Separators**
Quantity:	**2 Off**
Purchase Order:	**KEL105/24/11/2022**
Kelburn Job No.:	**39403/4**
Kelburn Description:	**6” MK IV KS Coalescent Type Cyclone Separator.**
Kelburn Serial Nos.:	**20935 & 20936**

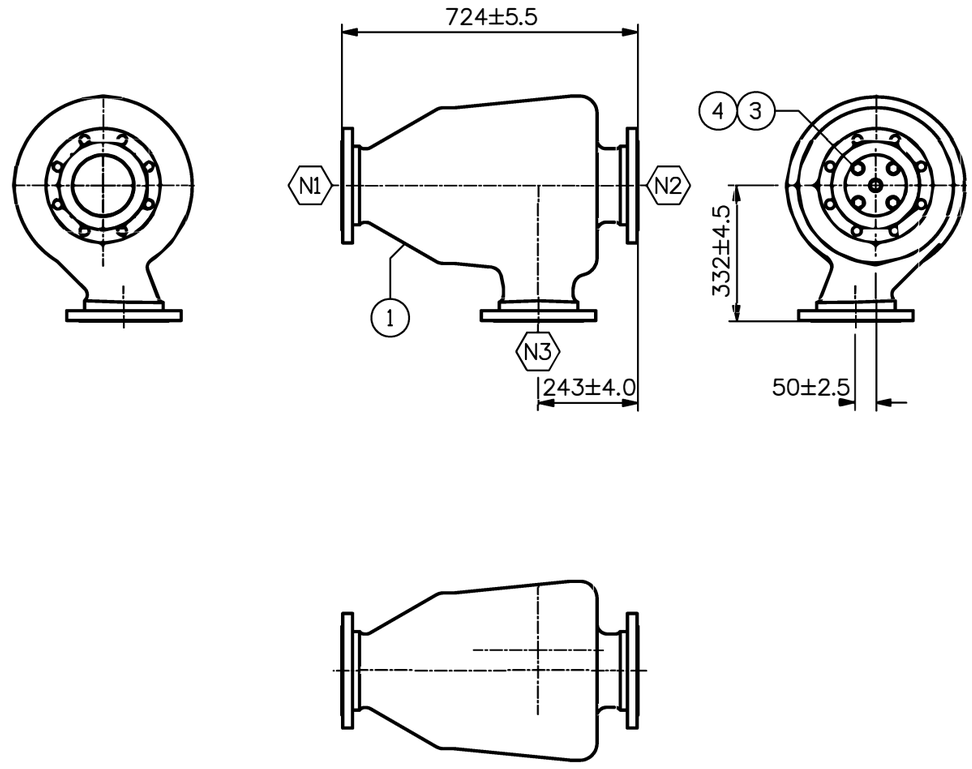
1ST ANGLE PROJECTION | DO NOT SCALE | IF IN DOUBT ASKI

PROJECT DATA

CUSTOMER	PETROTEL LUKOIL SA
CUSTOMER REFERENCE	PO No. KEL105/24–11–2022
CUSTOMER PROJECT	–
EQUIPMENT TAG NUMBER	–
KELBURN REFERENCE	Job No. 39403, SN 20935

DESIGN DATA

FLUID / PED GROUP	Hydrogen Gas, Group 1
PED 2014/68/EU	Category III, Module G
DESIGN CODE	ASME VIII–1 (No Code Stamp)
OPERATING CONDITIONS	13 barg @ 35·C
DESIGN CONDITIONS	FV/16 barg @ –45/+70 C
CORROSION ALLOWANCE	1.6mm
VISUAL (VT)	100%
LIQUID PENETRANT (PT)	None
MAGNETIC PARTICLE (MT)	100%
ULTRASONIC (UT)	None
RADIOGRAPHIC (RT)	None
TEST PRESSURE	23 barg
EMPTY WEIGHT	259 kg
OPERATIONAL WEIGHT	259 kg
HYDROTEST WEIGHT	306 kg
INTERNAL VOLUME	47 Litres
COATING SYSTEM	1x Primer, 2x Intertherm 50.
CASTING HEAT TREATMENT	Quenched @ 920°C, tempered @ 640°C.



NOTES

1. FLANGE BOLT HOLES TO STRADDLE PRINCIPAL CENTRELINES OF THE VESSEL.
2. ITEMS 2 & 5 NOT SHOWN ON DRAWING.

Mark	Service	Size/Rating/Type
N1	Separator Inlet	6" ASME B16.5 Class 150 RF
N2	Separator Outlet	6" ASME B16.5 Class 150 RF
N3	Separator Drain	6" ASME B16.5 Class 150 RF

Item	Description	Description/Location	Size/Rating	Qty/Lth	Material	Material Heat Nos.
1	Body	Cyclone Separator Body	6" MK IV KS, #150 RF	1 / 724mm	ASME SA352 LCB	22M138
2	Agglomerator Plates	Deflector	–	2	ASTM A240 TP316L	–
3	Setpin	Deflector	M16	5	Stainless Steel A2	–
4	Washer	Deflector	M16	15	Stainless Steel A2	–
5	Spring Washer	Deflector	M16	5	Stainless Steel A2	–

Rev.	Modification	Loc	Drawn	Date
2	As built / supplied drawing.	–	SB	28/04/23
1	Correct operational weight	2C	NB	31/01/23
0	Original Issue	–	–	–

KELBURN
Kelburn Engineering Limited
25 Hawbank Road,
College Milton North
East Kilbride, G74 5EG, UK
T: +44 (0)1355 573 456
F: +44 (0)1355 573 457
W: www.kelburneng.co.uk

Customer: PETROTEL LUKOIL SA

Customer Ref.: PO No. KEL105/24.11.2022

Kelburn Ref.: 39403

Material Type & Spec.: See above bill of materials.

Pattern/Part No.: 21063L/F/F

Test Pressure: 23 Barg

Drawn: S.Bradley

Date: 13/12/22

Scale: 1:15

Checked: N.Bonner, M.Watson

Weight: 259 kgs

Title: 6" MK IV KS Coalescent Type Cyclone Separator General Arrangement Drawing

Size: A3

Drg No: 12294–4

Rev: 2

Sheet: 1/1

Customer:	**PETROTEL LUKOIL SA**
Equipment Description:	**6" MK IV KS Coalescent Type Cyclone Separators**
Quantity:	**2 Off**
Purchase Order:	**KEL105/24/11/2022**
Kelburn Job No.:	**39403/4**
Kelburn Description:	**6" MK IV KS Coalescent Type Cyclone Separator.**
Kelburn Serial Nos.:	**20935 & 20936**

Section 1: General Arrangement Drawing.

General Arrangement Drawing. No. 12294-4 Rev. 2
General Arrangement Drawing. No. 12295-4 Rev. 2
Nameplate Drawing NPD 39403 Rev. 1.
Nameplate Drawing NPD 39404 Rev. 1.

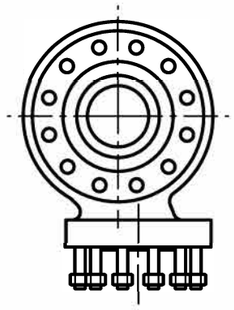
1ST ANGLE PROJECTION | DO NOT SCALE | IF IN DOUBT ASKI

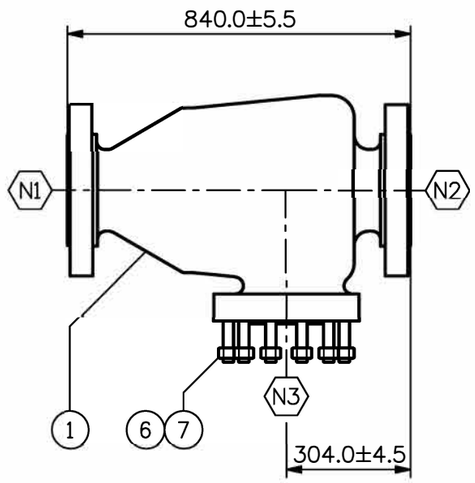
PROJECT DATA

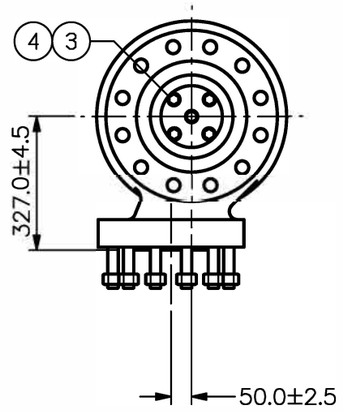
CUSTOMER	PETROTEL LUKOIL SA
CUSTOMER REFERENCE	PO No. KEL105/24-11-2022
CUSTOMER PROJECT	–
EQUIPMENT TAG NUMBER	–
KELBURN REFERENCE	Job No. 39404, SN 20936

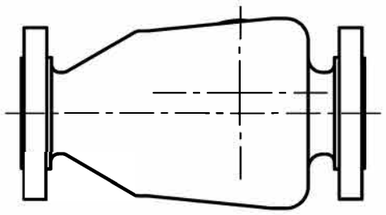
DESIGN DATA

FLUID / PED GROUP	Hydrogen Gas, Group 1
PED 2014/68/EU	Category IV, Module G
DESIGN CODE	ASME VIII-1 (No Code Stamp)
OPERATING CONDITIONS	53 barg @ 85°C
DESIGN CONDITIONS	FV/60 barg @ -45/+100°C
CORROSION ALLOWANCE	1.6mm
VISUAL (VT)	100%
LIQUID PENETRANT (PT)	None
MAGNETIC PARTICLE (MT)	100%
ULTRASONIC (UT)	None
RADIOGRAPHIC (RT)	None
TEST PRESSURE	86 barg
EMPTY WEIGHT	550 kg
OPERATIONAL WEIGHT	550 kg
HYDROTEST WEIGHT	597 kg
INTERNAL VOLUME	47 Litres
COATING SYSTEM	1x Primer, 2x Intertherm 50.
CASTING HEAT TREATMENT	Quenched @ 920°C, tempered @ 640°C.









NOTES

1. FLANGE BOLT HOLES TO STRADDLE PRINCIPAL CENTRELINES OF THE VESSEL.
2. ITEMS 2 & 5 NOT SHOWN ON DRAWING.

Item	Description	Description/Location	Size/Rating	Qty/Lth	Material	Material Heat Nos.
1	Body	Cyclone Separator Body	6" MK IV KS, #600 RF	1 / 840mm	ASME SA352 LCB	22M138
2	Agglomerator Plates	Deflector	–	2	ASTM A240 TP316L	–
3	Setpin	Deflector	M16	5	Stainless Steel A2	–
4	Washer	Deflector	M16	15	Stainless Steel A2	–
5	Spring Washer	Deflector	M16	5	Stainless Steel A2	–
6	Studbolt	Drain Flange	1" UNC	12 / 130mm	ASTM A193 B7	616040064
7	Heavy Hex Nut	Drain Flange	1" UNC	12	ASTM A194 2H	G190009864

Mark	Service	Size/Rating/Type
N1	Separator Inlet	8" ASME B16.5 Class 600 RF
N2	Separator Outlet	8" ASME B16.5 Class 600 RF
N3	Separator Drain	6" ASME B16.5 Class 600 RF

Rev.	Modification	Loc	Drawn	Date
2	As built / supplied drawing.	–	SB	28/04/23
1	Correct test pressure.	2C	NB	31/01/23
0	Original Issue	–	–	–

KELBURN
Kelburn Engineering Limited
25 Hawbank Road,
College Milton North
East Kilbride, G74 5EG, UK
T: +44 (0)1355 573 456
F: +44 (0)1355 573 457
W: www.kelburneng.co.uk

Customer: PETROTEL LUKOIL SA

Customer Ref.: PO No. KEL105/24.11.2022

Kelburn Ref.: 39404

Material Type & Spec.: See above bill of materials.

Pattern/Part No.: 21063H/G/F/C

Test Pressure: 86 Barg

Drawn: S.Bradley

Date: 13/12/22

Scale: 1:15

Checked: N.Bonner, M.Watson

Weight: 550 kgs

Title: 6" MK IV KS Coalescent Type Cyclone Separator General Arrangement Drawing

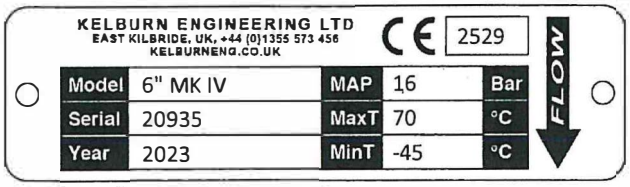
Size	Drg No	Rev	Sheet
A3	12295-4	2	1/1

KELBURN	**Manufacturer:** Kelburn Engineering Ltd	**Document Name:** NPD-39403
	Equipment: 6" MK IV Cyclone Separator	
	Customer: PETROTEL LÜKOIL SA Order № KEL105/24.11.2022, Line No. 1	**Job No:** 39403 / **Page:** 1 of 1

Document Title

Nameplate Drawing (NPD)

Design Conditions			
Design Pressure:	FV / 16 barg	Design Temperature:	-45°C to 70°C



Size: 23 mm x 83 mm

Quantity	1 of 1
Serial No.	20935
Approved Body	TÜV NORD Scandinavia AB (2529)

THE PRESSURE EQUIPMENT SHALL BE OPERATED WITHIN CONDITIONS IDENTIFIED ON THE ABOVE NAMEPLATE

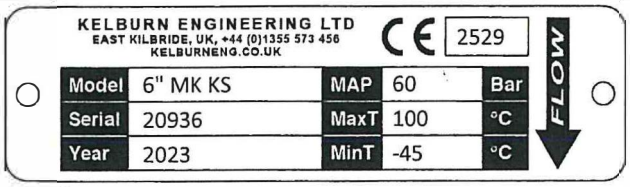
Rev	Reason for Issue	Issued By	Date
1	Issue for manufacture	SB	28/04/2023
0	Issued for approval	Neil Bonner	06/02/2023

KELBURN	**Manufacturer:** Kelburn Engineering Ltd	**Document Name:** NPD-39404	
	Equipment: 6" MK KS Cyclone Separator		
	Customer: PETROTEL LÜKOIL SA Order № KEL105/24.11.2022, Line No. 2	**Job No:** 39404	**Page:** 1 of 1

Document Title

Nameplate Drawing (NPD)

Design Conditions			
Design Pressure:	FV / 60 barg	Design Temperature:	-45°C to 100°C



Quantity	1 of 1
Serial No.	20936
Approved Body	TÜV NORD Scandinavia AB (2529)

Size: 23 mm x 83 mm

THE PRESSURE EQUIPMENT SHALL BE OPERATED WITHIN CONDITIONS IDENTIFIED ON THE ABOVE NAMEPLATE

Rev	Reason for Issue	Issued By	Date
1	Issued for approval	SB	28/04/2023
0	Issued for approval	Neil Bonner	06/02/2023

Customer:	**PETROTEL LUKOIL SA**
Equipment Description:	**6" MK IV KS Coalescent Type Cyclone Separators**
Quantity:	**2 Off**
Purchase Order:	**KEL105/24/11/2022**
Kelburn Job No.:	**39403/4**
Kelburn Description:	**6" MK IV KS Coalescent Type Cyclone Separator.**
Kelburn Serial Nos.:	**20935 & 20936**

Section 2: Material Test Certificates.

Gulf Metal Foundry Certificate No. KELB-001-2023.
LoneStar Fastener Europe Certificate No. 382428.

GULF METAL FOUNDRY (LLC)

P.O. Box 48839, Dubai, U.A.E. Tel : 7071000, Fax : 3470354
e-mail : mail@foundry.ae / sales@foundry.ae
URL : www.foundry.ae
EASA SALEH AL GURG GROUP

الخليج لصهر الحديد (ش.ذ.م.م)
ص.ب. : ٤٨٨٣٩، دبي – ا.ع.م. تليفون : ٧٠٧١٠٠٠، فاكس : ٣٤٧٠٣٥٤
البريد الالكتروني : mail@foundry.ae / sales@foundry.ae
URL : www.foundry.ae
مجموعة عيسى صالح القرق

MATERIAL TEST CERTIFICATE

LAB/FORM/001 REV.02 DT:02.06.2016

AS PER EN 10204 - 3.1

Customer	: M/s KELBURN ENGG LTD , UK	**Certificate.No**	: KELB/001/2023
P.O Reference	: 14392-SB-K Dt. : 13.12.2022	**Date**	: 08.02.2023
Material Spec	: ASME SA352 - 2020 Gr. LCB	**Supply Condition**	: As Cast

CHEMICAL PROPERTIES

Element		C %	Mn %	Si %	P %	S %	*Cr %	*Ni %	*Mo %	*Cu %	*V %	*TRE	CE		
Specified	Min	--	--	--	--	--	--	--	--	--	--	--	--		
Heat No	Max	0.23	1.00	0.60	0.035	0.025	0.05	0.50	0.20	0.30	0.030	1.00	0.50		
22M138		0.20	0.92	0.39	0.017	0.011	0.09	0.34	0.022	0.18	0.009	0.63	0.41		

MECHANICAL PROPERTIES

Requirements		Yield Strength (Rp 0.2%) (Mpa)	Tensile Strength (Mpa)	Elongation % GL=50mm or 2 Inch	Reduction of Area %	Hardness BHN	Bend Test	Impact value CVN in Joules @ -46°C (Specimen size 10X10X55 mm)			
Specified	Min	240	450	24	35	--	--	Single Value			Avg. Value
Heat No	Max	--	620	--	--	237	--	14			18
22M138		402	574	32.3	69.5	165	..	34	30	38	34

Heat Treatment Details

Heat No	Cycle No	Heat Treatment Process	Quench Media	Quench Bath Temperature		Remarks
				Before	After	
22M138	A6537	Quenched @ 920° C	Water	29°C	43°C	OK
22M138	A6538	Tempered @ 640° C	Air	..	..	OK

POURING DETAILS

Heat No	PO LINE ITEM No	Item Description	Drawing Number / Pattern Number	RT No	MPI No	DP No	UT No	Qty
22M138	1	Kelburn 6" KSS Cyclone Separator casting	9274-1 Rev. 4 / 21063L/F/F	..	MT0233	..	..	1
22M138	2	Kelburn 6" KSS Cyclone Separator casting	10011-1 Rev. 4 / 21063H/G/F/C	..	MT0286	..	..	1

Remarks :

Foundry Identification : : GMF
Test as per Spec. : ASTM A370-2022
Visual Inspection of Castings: : Satisfactory according to ANSI/MSS SP-55 Type XII
Dimension Inspection : : Satisfactory According to Approved Drawing.
NDT Inspection : MPI inspection carried out and found satisfactory as per ASME B16.34 Appendix.II

Casting meet the requirements of PED 2014/68/EU.
The above Material confirms to NACE MR0175 / ISO 15156 - 2015 and free from Radioactive contamination.

The above castings were manufactured, sampled, tested and inspected in accordance with the customer's material specification and were found to meet the requirements.

Prepared by
V.Muthuraman
Engineer - LAB

Approved by
T.Vignesh
Quality Engineer

GULF METAL FOUNDRY (L.L.C.) P.O. Box 48839, DUBAI, U.A.E.

KELBURN
TRUE COPY
Sign ..... Date 12/05/2023

LoneStar Fasteners Europe

Steelmans Road, Wednesbury,
West Midlands, WS10 9UZ, England.
Tel: 0121 435 0009
E-Mail: sales@lsfe.com Website: www.lonestargroup.com

TEST CERTIFICATE No.

CERTIFIED TO BS EN 10204 ~~2.2~~/3.1/~~3.2~~

382428

KELBURN ENGINEERING LTD
25 HAWBANK ROAD
COLLEGE MILTON NORTH
EAST KILBRIDE
G74 5EG

DATE: 30/03/2023
YOUR O/No: 14473-SB-K
OUR O/No: 493082
ADVICE NOTE No: PS 809293

Item	Heat Number	Specification	Finish
1	G190009864	ASTM A194 2H	Plain
2	616040064	ASTM A193 B7	Plain

Item	Diameter	Stock Description
1	1.0 in	1" HEX NUT - 12 OFF
2	1.0 in	1" X 5" STUDBOLT - 12 OFF

Chemical Analysis

Item	C	Si	Mn	P	S	Cr	Mo
1	0.44 %	0.22 %	0.59 %	0.012 %	0.005 %		
2	0.39 %	0.23 %	0.83 %	0.009 %	0.005 %	0.98 %	0.194 %

Mechanical Properties

Item	UTS	Hardness Prod1	Yield	Hardness Prod2	Elong	Hardness 24hr Min	RofA
1		28.00 HRC		30.00 HRC		92.00 HRB	
2	139.00 ksi	29.00 HRC	122.90 ksi	30.00 HRC	21.30 %		60.10 %

Item	Hardness 24hr Max	Heat Treatment
1	96.00 HRB	Quenched & Tempered
2		Quenched & Tempered

Additional Information

Item	Line Comments
1	Proof Load Satisfactory
2	

Comments

None

KELBURN
TRUE COPY
Sign ..... Date 12/05/2023

Liam Cornes
Certification Officer

For and on behalf of
LoneStar Fasteners Europe

One of the largest UK Stockholders and Manufacturers of Standard and Special Petrochemical Bolting

LoneStar Fasteners Europe is a member of the LoneStar Group

Customer:	**PETROTEL LUKOIL SA**
Equipment Description:	**6" MK IV KS Coalescent Type Cyclone Separators**
Quantity:	**2 Off**
Purchase Order:	**KEL105/24/11/2022**
Kelburn Job No.:	**39403/4**
Kelburn Description:	**6" MK IV KS Coalescent Type Cyclone Separator.**
Kelburn Serial Nos.:	**20935 & 20936**

Section 3: Non-Destructive Testing Reports.

Gulf Metal Foundry Magnetic Particle Inspection Report No. MT/KEL/001/2023.
Dinesh Kumar Anbalagan Certificate No. 2022-05-09-Magnetic Testing (MT) -91-ISO.

GULF METAL FOUNDRY (LLC)
P.O. Box 48839, Dubai, U.A.E. Tel : 7071000, Fax : 3470354
e-mail : mail@foundry.ae / sales@foundry.ae
URL : www.foundry.ae
EASA SALEH AL GURG GROUP

الخليج لصهر الحديد (ش.ذ.م.م)
ص.ب. : ٤٨٨٣٩، دبي – ا.ع.م. تليفون : ٧٠٧١٠٠٠، فاكس : ٣٤٧٠٣٥٤
البريد الالكتروني : mail@foundry.ae / sales@foundry.ae
URL : www.foundry.ae
مجموعة عيسى صالح القرق

TEST REPORT

GMF/QC/F026 Rev 02 Dt: 28/04/2020

MAGNETIC PARTICLE INSPECTION REPORT

Customer Name	M/s KELBURN ENGG LTD , UK	**MPI Report No.**	:	MT/KEL/001/2023	
PO No.	14392-SB-K Dt. : 13.12.2022	**Report Date**	:	08.02.2023	
Material Grade	ASME SA352 - 2020 Gr. LCB	**Page No.**	:	1 of 1	
Magnetizing Technique		Circular magnetization - Continuous method			
Method of inspection / Equipment used		Wet Fluorescent - HWDC Prod method			
Testing Media		Water			
Method of particle application		Flow on			
Magnetising current		375-750 A			
Prod spacing		75mm - 150 mm			
Sensitivity checked on		BHEL Plate, Burmah Castrol Strip			
Area coverage		100% Accessible area (on all accessible external and internal surfaces)			
Surface Condition		As cast - Grinded & Shot blasted			
Stage of inspection		After heat treatment			
Procedure		GMF/NDT/MT Rev.13			
Acceptance		ASME B16.34 APPENDIX. II			

MPI Machine	2016122590	**Calibrated on**	15.10.2022	**Calibration due on**	14.04.2023
Black Light Meter	R.035609	**Calibrated on**	15.09.2022	**Calibration due on**	14.03.2023
Black Light Intensity	1180 µW/cm²	**Surface temperature**	32°C	**Tested on**	29.12.2022

Sl. No.	Item Description	Pattern No.	Heat No.	Qty	MPI No.	Observation
1	Kelburn 6" KSS Cyclone Separator casting	9274-1 Rev. 4 / 21063L/F/F	22M138	1	MT0233	NO RECORDABLE INDICATION
2	Kelburn 6" KSS Cyclone Separator casting	10011-1 Rev. 4 / 21063H/G/F/C	22M138	1	MT0286	NO RECORDABLE INDICATION

Remarks:

Inspected By	Reviewed By	
DineshKumar Anbalagan ISO 9712 Level II - MT	Vignesh Thangavel SNT TC 1A NDT Level II -(MT,PT,UT,VT,RT)	KELBURN TRUE COPY Sign ..... Date 12/05/2023

MOD 12 Rev.01 del 31/12/2021
Certified Professionals
Scheme # 01

Non-Destructive Testing Personnel
Industrial Sector

2022-05-09-Magnetic Testing (MT)-91-ISO

Certificate Number

This is to certify that

Dinesh Kumar Anbalagan

Place of birth: Poomalaikundu

Date of birth: 06/03/1994

Achieved professional qualification for the method:

Magnetic Testing (MT) - Level 2

For the industrial sector relevant to Pre-service and in-service testing of equipment, systems and facilities on following products: ["C (Castings) "," F (Forgings)"," T (Tubes and Pipes)"," WP (Wrought Products)"," W (Welds)","P (Composite material)"].

This Certificate is in compliance with **UNI EN ISO 9712 :2012** and TC2 GR Certification Scheme TC2GR SCH 01.

Confirmation of the validity of certification can be verified on website www.tc2services.com or by contacting TC2 Global Register

2022-05-09	2022-05-09	2027-05-09
Issued on	Current Issue	Expiring date

Via Pasubio, 5 | 24044 Dalmine (BG)

+39 035 4517 409

Ing. Antonio Borraccino

Technical Manager
TC2 Global Register S.r.l.

www.tc2group.com
info@tc2services.com

PRS N° 125 C

Signatory of EA, IAF and ILAC Mutual Recognition Agreement

Customer:	**PETROTEL LUKOIL SA**
Equipment Description:	**6" MK IV KS Coalescent Type Cyclone Separators**
Quantity:	**2 Off**
Purchase Order:	**KEL105/24/11/2022**
Kelburn Job No.:	**39403/4**
Kelburn Description:	**6" MK IV KS Coalescent Type Cyclone Separator.**
Kelburn Serial Nos.:	**20935 & 20936**

Section 4: Hydraulic Pressure Test Certificate.

39403 Hydraulic Test Certificate.
Gauge Developments Group Certificate No. 101223.
39404 Hydraulic Test Certificate.
Gauge Developments Group Certificate No. 101629.

KELBURN ENGINEERING LTD

25 Hawbank Road
College Milton North
East Kilbride
Glasgow
G74 5EG
UK

Telephone: +44 (0) 1355 573456
E-mail: info@kelburneng.co.uk
Website: www.kelburneng.co.uk

39403

Job No: 39403

PETROTEL LUKOIL SA
Romania

HYDRAULIC PRESSURE TEST CERTIFICATE

This is to certify that the 6" MK IV KS Coalescent Type Cyclone Separator has been hydraulically pressure tested to 23 barg, showed no evidence of leaking and was found to be satisfactory.

PO No.:	KEL105/24.11.2022
Separator Type:	6" MK IV KS
Nominal Bore:	150mm
Kelburn Serial No:	20935
Year of Manufacture:	2023
Maximum allowable Working pressure:	16 barg
Maximum Allowable Working Temperature:	70°C
Minimum Allowable Working Temperature:	-45°C
Hydraulic Test Pressure:	23 bar
Casting Material Heat No:	22M138
Test Medium:	Mains water
Test Medium Temperature:	7.3°C (Typical)
Test Duration:	30 Minutes
Test Gauge Serial No.:	101223-22
Ambient Temperature:	15°C (Typical)

Signed 02/05/23

Mike Watson
Kelburn Engineering Limited

Signed 02/05/23

Ian Felce
TUV NORD Scandinavia AB

Gauge Developments Group LTD

Calibration Certificate.

Certificate No:	101223	Issue date:	7/NOV/22

Customer:	KELBURN ENGINEERING LTD		
Customer Order No:	14337-NB-K		
Gauge Serial No:	101223-22		
Type:	100.DB.11.B4		
Range:	40 bar	Accuracy class (%):	1.0
Percentage uncertainty:	0.25		

Test Equipment:	12127/280H	UKAS Certificate Ref: 91462

Condition: [x] New. [ ] As Received. [ ] After Calibration

Actual Pressure. bar	% Error.	
	Rising.	Falling.
0	0	0
10	0	+0.2
20	+0.1	+0.4
30	+0.2	+0.6
40	+0.6	-
Tested in accordance with BS EN 837		

Signed: _____ On behalf of Gauge Developments Group Ltd.

South Street
Ashton-Under-Lyne
Lancashire
OL7 0FW

phone 0161 330 2726
fax 0161 330 9369
info@gdgltd.co.uk
www.gdgltd.co.uk

TÜV NORD TÜV UK Ltd. ISO 9001 UKAS MANAGEMENT SYSTEMS 065

CHAMOIS METROLOGY

CERTIFICATE OF CALIBRATION

ISSUED BY: CHAMOIS METROLOGY LTD
DATE OF ISSUE: 05 January 2022
CERTIFICATE NUMBER: 91462

0822

Chamois Metrology Ltd
Unit 8 & 9, The Centre
Holywell Business Park
Northfield Road, Southam
Warwickshire. CV47 0FP

Tel: 01926 812066
Fax: 01926 813569
E-mail: info@chamois.net
Web: www.chamois.net

APPROVED SIGNATORY

☐ N A Morgan ☐ B Hemple
☑ A Garthwaite ☐ S Kelly

CUSTOMER DETAILS Company : GAUGE DEVELOPMENTS LIMITED
SOUTH STREET
ASHTON-U-LYNE
LANCASHIRE
OL7 0HX

Order Number : 31303

UNIT CALIBRATED

Date Calibrated	: 05 JANUARY 2022
Calibration Site	: CHAMOIS METROLOGY LABORATORY
Manufacturer	: BUDENBERG
Model Number	: 280H
Description	: HYDRAULIC DEADWEIGHT TESTER
Base Serial No.	: 12127/280H
PCU Serial No.	: M953
Mass Set Serial No.	: 8280

CALIBRATION PROCEDURE : PROC-10A; 45

ENVIRONMENT TEMPERATURE : 19.4 °C

CUSTOMER REQUIREMENT : UKAS CERTIFICATION

TRACEABILITY STATEMENT

All measuring equipment used for calibration purposes is traceable to National or Internationally recognised standards.

Certified By:

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0822

RESULTS - LOW RANGE

The piston cylinder was received in working order. Both the piston and cylinder were cleaned prior to calibration. The piston cylinder assembly was installed in a laboratory base unit and loaded with the customer supplied masses for the calibration.

The mass of the piston was measured as 568.179 3 g ± 3.4 mg.

The piston mass was compared against a laboratory reference mass set using a substitution technique. The reported conventional mass value represents a hypothetical weight of density 8000 kg m^{-3} at 20 °C which would balance the mass in an air density of 1.2 kg m^{-3}.

The effective area of the piston cylinder assembly was determined over the range 80 psi to 800 psi at 20 °C and found to be: -

$$8.065\,434 \times 10^{-5}\ m^2$$

The uncertainty on the reported effective area is: -
From 80 psi to 800 psi: ±71 ppm

The effective area was determined referenced to the bottom face of the piston in its mid operating position. This face was determined to be 0.03084 m below the lower external stepped face of the low pressure cylinder.

The unit under test temperature was measured on the piston/cylinder assembly.

The thermal expansion coefficient was taken from manufacturer's data as 23.0 x 10^{-6} $°C^{-1}$

The unit under test was levelled by placing a bubble level indicator on the mass stack at various indexed positions at each point.

Calibration performed with the piston rotating clockwise, manual at a speed of approximately ½ Hz.

The oil used for the measurements was sebacate. The density of this oil is 914 kg m^{-3} and the surface tension 0.025 N m^{-1}.
Excess oil was mopped away from the drain hole.

The buoyancy volume of the piston was measured as 3.17 x 10^{-7} m^3. This will produce an upthrust dependent on the pressurising medium.

The surface tension was determined acting on the circumference of the piston which was measured as 0.0318 m. This will produce a downthrust dependent on the pressurising medium.

The conversion value used in relation to the pascal was 1.450377 x 10^{-4} psi.

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a confidence level of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0822

CERTIFICATE NUMBER
91462

RESULTS - HIGH RANGE

The piston cylinder was received in working order. Both the piston and cylinder were cleaned prior to calibration. The piston cylinder assembly was installed in a laboratory base unit and loaded with the customer supplied masses for the calibration.

The mass of the piston was measured as 566.938 2 g ± 3.4 mg.

The piston mass was compared against a laboratory reference mass set using a substitution technique. The reported conventional mass value represents a hypothetical weight of density 8000 kg m^{-3} at 20 °C which would balance the mass in an air density of 1.2 kg m^{-3}.

The effective area of the piston cylinder assembly was determined over the range 800 psi to 16 000 psi at 20 °C and found to be expressible in the form: -

$$A_P = A_{(0,20)} \times (1 + (\lambda \times P))$$

Where: -

A_P = Effectve area at pressure P

$A_{(0,20)}$ = Effective area at zero pressure and 20 °C which was determined to be 4.033 307 x 10^{-6} m^2

λ = Pressure distortion coefficient which was determined to be 2.24 x 10^{-8} psi^{-1}

P = Approximate system pressure in psi

The combined uncertainty on the reported effective area and distortion coefficient is: -
From 800 psi to 16 000 psi: ±62 ppm

The effective area was determined referenced to the bottom face of the piston in its mid operating position. This face was determined to be 0.02059 m below the lower external stepped face of the low pressure cylinder.

The unit under test temperature was measured on the piston/cylinder assembly.
The thermal expansion coefficient was taken from manufacturer's data as 23.0 x 10^{-6} $°C^{-1}$

The unit under test was levelled by placing a bubble level indicator on the mass stack at various indexed positions at each point.

Calibration performed with the piston rotating clockwise, manual at a speed of approximately ½ Hz.

The oil used for the measurements was sebacate. The density of this oil is 914 kg m^{-3} and the surface tension 0.025 N m^{-1}.
Excess oil was not mopped away from the drain hole.

The buoyancy volume of the piston was measured as -5.33 x 10^{-9} m^3. This will produce an upthrust dependent on the pressurising medium.

The surface tension was determined acting on the circumference of the auxiliary piston which was measured as 0.03176 m. This will produce a downthrust dependent on the pressurising medium.

The conversion value used in relation to the pascal was 1.450377 x 10^{-4} psi.

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a confidence level of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

KELBURN
SEPARATION SPECIALISTS

KELBURN ENGINEERING LTD

25 Hawbank Road
College Milton North
East Kilbride
Glasgow
G74 5EG
UK

Telephone: +44 (0) 1355 573456
E-mail: info@kelburneng.co.uk
Website: www.kelburneng.co.uk

39404

Job No: 39404

PETROTEL LUKOIL SA
ROMANIA

HYDRAULIC PRESSURE TEST CERTIFICATE

This is to certify that the 6" MK IV KS Coalescent Type Cyclone Separator has been hydraulically pressure tested to 86 barg, showed no evidence of leaking and was found to be satisfactory.

PO No.:	KEL105/24.11.2022
Separator Type:	6" MK IV KS
Nominal Bore:	150mm
Kelburn Serial No:	20936
Year of Manufacture:	2023
Maximum allowable Working pressure:	60 barg
Maximum Allowable Working Temperature:	100°C
Minimum Allowable Working Temperature:	-45°C
Hydraulic Test Pressure:	86 bar
Casting Material Heat No:	22M138
Test Medium:	Mains water
Test Medium Temperature:	7.3°C (Typical)
Test Duration:	30 Minutes
Test Gauge Serial No.:	101629-23
Ambient Temperature:	15°C (Typical)

Signed 02/05/23

Mike Watson
Kelburn Engineering Limited

Signed 02/05/23

Ian Felce
TUV NORD Scandinavia AB

Gauge Developments Group LTD

Calibration Certificate.

Certificate No:	101629	Issue date:	27/FEB/23

Customer:	KELBURN ENGINEERING LTD		
Customer Order No:	14439-NB-K		
Gauge Serial No:	101629-23		
Type:	100.DB.11.B4		
Range:	250 bar	Accuracy class (%):	1.0
Percentage uncertainty:	0.25		

Test Equipment:	12127/280H	UKAS Certificate Ref: 102838

Condition: [x] New. [ ] As Received. [ ] After Calibration

Actual Pressure. bar	% Error.	
	Rising.	Falling.
0	0	0
50	0	0
100	-0.1	-0.1
150	-0.2	-0.1
200	-0.2	-0.1
250	-0.1	-
Tested in accordance with BS EN 837		

Signed: _____ On behalf of Gauge Developments Group Ltd.

South Street
Ashton-Under-Lyne
Lancashire
OL7 0FW

phone 0161 330 2726
fax 0161 330 9369
info@gdgltd.co.uk
www.gdgltd.co.uk

CHAMOIS METROLOGY

CERTIFICATE OF CALIBRATION

ISSUED BY: CHAMOIS METROLOGY LTD
DATE OF ISSUE: 09 January 2023
CERTIFICATE NUMBER: 102838

ilac-MRA UKAS CALIBRATION 0822

Chamois Metrology Ltd
Unit 8 & 9, The Centre
Holywell Business Park
Northfield Road, Southam
Warwickshire. CV47 0FP

Tel: 01926 812066
Fax: 01926 813569

E-mail: info@chamois.net
Web: www.chamois.net

APPROVED SIGNATORY

☐ N A Morgan ☐ B Hemple
☑ S Kelly

CUSTOMER DETAILS

Company : GAUGE DEVELOPMENTS LIMITED
SOUTH STREET
ASHTON-U-LYNE
LANCASHIRE
OL7 0HX

Order Number : 32147

UNIT CALIBRATED

Date Calibrated	: 09 JANUARY 2023
Calibration Site	: CHAMOIS METROLOGY LABORATORY
Manufacturer	: BUDENBERG
Model Number	: 280H
Description	: HYDRAULIC DEADWEIGHT TESTER
Base Serial No.	: 12127/280H
PCU Serial No.	: M953
Mass Set Serial No.	: 8280

CALIBRATION PROCEDURE : PROC-10A; 45

ENVIRONMENT TEMPERATURE : 19.6 °C

CUSTOMER REQUIREMENT : UKAS CERTIFICATION

TRACEABILITY STATEMENT

All measuring equipment used for calibration purposes is traceable to National or Internationally recognised standards.

Certified By:

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0822

CERTIFICATE NUMBER
102838

RESULTS - LOW RANGE

The piston cylinder was received in working order. Both the piston and cylinder were cleaned prior to calibration. The piston cylinder assembly was installed in a laboratory base unit and loaded with the customer supplied masses for the calibration.

The mass of the floating element was measured as 568.186 3 g ± 3.4 mg.

The floating element mass was compared against a laboratory reference mass set using a substitution technique. The reported conventional mass value represents a hypothetical weight of density 8000 kg m^{-3} at 20 °C which would balance the mass in an air density of 1.2 kg m^{-3}.

The effective area of the piston cylinder assembly was determined over the range 80 psi to 800 psi at 20 °C and found to be: -

$$8.065\,638 \times 10^{-5}\ m^2$$

The uncertainty on the reported effective area is: -
From 80 psi to 800 psi: ±55 ppm

The effective area was determined referenced to the bottom face of the piston in its mid operating position. This face was determined to be 0.03084 m below the lower external stepped face of the low pressure cylinder.

The unit under test temperature was measured on the piston/cylinder assembly.

The thermal expansion coefficient was taken from manufacturer's data as $23.0 \times 10^{-6}\ °C^{-1}$

The unit under test was levelled by placing a bubble level indicator on the mass stack at various indexed positions at each point.

Calibration performed with the piston rotating clockwise, manual at a speed of approximately ½ Hz.

The oil used for the measurements was sebacate. The density of this oil is 914 kg m^{-3} and the surface tension 0.025 N m^{-1}.
Excess oil was mopped away from the drain hole.

The buoyancy volume of the piston was measured as $3.17 \times 10^{-7}\ m^3$. This will produce an upthrust dependent on the pressurising medium.

The surface tension was determined acting on the circumference of the piston which was measured as 0.0318 m. This will produce a downthrust dependent on the pressurising medium.

The conversion value used in relation to the pascal was 1.450377×10^{-4} psi.

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0822

CERTIFICATE NUMBER 102838

RESULTS - HIGH RANGE

The piston cylinder was received in working order. Both the piston and cylinder were cleaned prior to calibration. The piston cylinder assembly was installed in a laboratory base unit and loaded with the customer supplied masses for the calibration.

The mass of the floating element was measured as 566.944 4 g ± 3.4 mg.

The floating element mass was compared against a laboratory reference mass set using a substitution technique. The reported conventional mass value represents a hypothetical weight of density 8000 kg m^{-3} at 20 °C which would balance the mass in an air density of 1.2 kg m^{-3}.

The effective area of the piston cylinder assembly was determined over the range 800 psi to 16 000 psi at 20 °C and found to be expressible in the form: -

$$A_P = A_{(0,20)} \times (1 + (\lambda \times P))$$

Where: -

A_P = Effectve area at pressure P

$A_{(0,20)}$ = Effective area at zero pressure and 20 °C which was determined to be 4.033 221 x 10^{-6} m^2

λ = Pressure distortion coefficient which was determined to be 2.50 x 10^{-8} psi^{-1}

P = Approximate system pressure in psi

The combined uncertainty on the reported effective area and distortion coefficient is: -
From 800 psi to 16 000 psi: ±63 ppm

The effective area was determined referenced to the bottom face of the piston in its mid operating position. This face was determined to be 0.02059 m below the lower external stepped face of the low pressure cylinder.

The unit under test temperature was measured on the piston/cylinder assembly.

The thermal expansion coefficient was taken from manufacturer's data as 23.0 x 10^{-6} $°C^{-1}$

The unit under test was levelled by placing a bubble level indicator on the mass stack at various indexed positions at each point.

Calibration performed with the piston rotating clockwise, manual at a speed of approximately ½ Hz.

The oil used for the measurements was sebacate. The density of this oil is 914 kg m^{-3} and the surface tension 0.025 N m^{-1}.
Excess oil was not mopped away from the drain hole.

The buoyancy volume of the piston was measured as -5.33 x 10^{-9} m^3. This will produce a downthrust dependent on the pressurising medium.

The surface tension was determined acting on the circumference of the auxiliary piston which was measured as 0.03176 m. This will produce a downthrust dependent on the pressurising medium.

The conversion value used in relation to the pascal was 1.450377 x 10^{-4} psi.

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a confidence level of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Customer:	**PETROTEL LUKOIL SA**
Equipment Description:	**6" MK IV KS Coalescent Type Cyclone Separators**
Quantity:	**2 Off**
Purchase Order:	**KEL105/24/11/2022**
Kelburn Job No.:	**39403/4**
Kelburn Description:	**6" MK IV KS Coalescent Type Cyclone Separator.**
Kelburn Serial Nos.:	**20935 & 20936**

Section 5: EC Certificate of Conformity.

39403 Kelburn EU Declaration of Conformity.
TÜV Nord Scandinavia Design Examination Report 23119-01.
TÜV Nord Scandinavia Design Inspection Report 23119-IF-001 rev 1.
TÜV Nord Scandinavia Unit Verification Certificate No TNSE-PED-23-277.
39404 Kelburn EU Declaration of Conformity.
TÜV Nord Scandinavia Design Examination Report 23119-02.
TÜV Nord Scandinavia Design Inspection Report 23119-IF-002.
TÜV Nord Scandinavia Unit Verification Certificate No TNSE-PED-23-278.

EU DECLARATION OF CONFORMITY

Issued in Accordance with the

PRESSURE EQUIPMENT DIRECTIVE 2014/68/EU

We declare under our sole responsibility that the following product complies with the requirements of Pressure Equipment Directive 2014/68/EU. The details of the pressure equipment as listed/described below.

Product Description: 6" MK IV KS Coalescent Cyclone Separator
Serial No(s) 20935

PED 2014/68/EU: Pressure Vessel, Group 1, Category III, Module G

Manufacturer: Kelburn Engineering Ltd
25 Hawbank Road, East Kilbride, G74 5EG, United Kingdom

Notified Body: TÜV NORD Scandinavia AB
Gåsebäcksvägen 20, 252 27 Helsingborg, Sweden
Notified Body No. 2529

Applicable Standards: ASME BPVC II-DM, ASME BPVC VIII-1, ASME B16.5, ASME SA-352 Gr. LCB, and ISO 9001

Signed: _____

Name: Neil Bonner

Title: Quality Representative

Date: 28/04/2023

Rapport över bedömning av konstruktion /

Design Examination Report

Tillverkare: / Manufacturer: Kelburn Engineering Ltd 25 Hawbank Road East Kilbride Glasgow G74 5EG	**Uppdragsnummer /** Assignment No: 23119-01 **Referens** / Reference: 39403 **Order nummer** / Order number: 14424-NB-K

Förutsättningar / Test specifikation:

Föreskrift / Directive: **AFS 2016:1 /** 2014/68/EU

Standard / Technical specification, standards:

☐ DIN EN 13445 ☐ DIN EN 13480 ☐ DIN EN 12952 ☐ DIN EN 12953 ☐ AD2000

☐ ASME VIII,Div1 ☒ Annan/ Others: ASME VIII Div 1 (NCS)

Tryckbärande Anordning / Pressure Equipment described:

1 x 6" MK IV KS Coalescent Cyclone Separator (Pattern No. 21063L)

☒ **Tryckkärl /** Pressure vessel ☐ **Rörledning /** Piping

☐ **Säkerhetsutrustning /** Safety accesories ☐ **Tryckbärande tillbehör /** Pressure accesories

Kategori / / Category: **§8** ☐ **I** ☐ **II** ☐ **III** ☒ **IV** ☐

Modul/ Module: **G** ☒ **B Production type** ☐ **B Design type** ☐ **A2** ☐ **A** ☐

Granskad ritning / Reviewed drawing:

12294-4 Rev 1, 12002-1-39403 Rev 2

Rum / Chamber:		1	2	3
Beräkningstryck / Design pressure	**PS [bar]**	-1 / +16		
Beräkningstemperatur / Design temperature	**TS [°C]**	-45/+70		
Volym / Volume	**L**	47		
Fluid grupp / Fluid group		**1** ☒ **2** ☐	**1** ☐ **2** ☐	**1** ☐ **2** ☐
Nominell Diameter/ Nominel size	**DN**	-		

Ovanstående kontroller är utförda enligt direktivet 2014/68/EU och resulterade inte i några invändningar, under förutsättning att villkoren på sidan 2 uppfylls.

The design review was carried out in accordance with Directive 2014/68/EU and did not result in any objections, provided that the **requirements on pages 2** of the Design examination report are fulfilled.

Bilagor / Enclosures:

-

Datum / Date:

2023-04-28

Ort / Location:

Helsingborg

TÜV NORD Scandinavia AB

Elektroniskt undertecknad av Martin Olsson
Datum: 2023.04.28 16:17:25 +02'00'

Granskare/ Examiner: Martin Olsson

Anmält organ, id-nr 2529
Notified Body, Ident No. 2529

Rapport över bedömning av konstruktion /

Design Examination Report

Vilkor / Requirements		**Uppfyller ställda krav/** Meets the requirements		
		Ja / Yes	**Nej /** No	**NA**
Konstruktion/ Design:		☒	☐	☐
Material / Material:		☒	☐	☐
Svetsning / Welding:		☐	☐	☒
OFP – omfattning / NDT-amount:		☒	☐	☐
Utmattning / Fatigue:		☐	☐	☒
Externa laster / External loads:		☐	☐	☒
Krypning / Creep		☐	☐	☒

		Dokumentation finns/ Documents		
		Ja / Yes	**Nej /** No	**NA**
Riskanalys/ Hazard analysis		☒	☐	☐
Bruksanvisning / Operation manual		☒	☐	☐
WPS / WPS:		☐	☐	☒
WPQR / WPQR		☐	☐	☒

Kommentarer / Comments:

Anmärkningar / Remarks:

Slutkontroll av tryckbärande anordningar

Final assessment report for pressure equipment

Kontor / Test Laboratory: TÜV NORD SCANDINAVIA AB, Helsingborg	**Rapport nr.:** 23119-IF-001 rev 1 / **Test report No.::**
Modul: / Module: G ☒ F ☐ BP ☐	

Tillverkare: / Manufacturer:

Kelburn Engineering Ltd

25 Hawbank Road, East Kilbride

Glasgow, G74 5EG, UK

☒ **Tryckkärl** / **Vessel**	☐ **Säkerhetsutrustning** / **Safety accessories**
☐ **Rörledning** / **Piping**	☐ **Tryckbärande tillbehör** / **Pressure accessories**

Tillverkningsnummer.: / Manufacturing No.:	20935 (39403)	Kategori: / Category:	III
Avsedd användning: / Application:	1-off 6" Mk IV KS Coalescent Cyclone Seperator Pat. No. 21063L	Tillverkningsår: / Year of manufacture:	2023

Rum / Chamber			1	2	3
Min./max. Tryck / Min./max. allowable pressure	PS	[bar]	-1 to +16		
Min./max. Temperatur / Min./max. allowable temperature	TS	[°C]	-45 to +70		
Volym / Diameter / Volume / Nominal size	V/DN	[L/--]	47		
Fluid / Fluid			Hydrogen Gas		

Förutsättningar: / TEST SPECIFICATIONS:

Föreskrift: AFS 2016:1 Yes — Standarder / Standards: ASME VIII-1 (Non-Code Stamp)

Directive: 2014/68/EU

Avvikelser: / Nonconformities:

Tidigare kontroller: / PREVIOUS TESTS:

EU-typkontroll produktionstyp / EU type-examination production type	☐	Anmält organ: / Notified Body:		
EU-typkontroll konstruktionstyp / EU type-examination design type	☐	Adress: / Address:		
Kontroll av konstruktion / Examination of design	☒	Certifikat /Rapportnr.: / Certificate / Report No.:	23119-01	Datum: / Dated: 28/04/2023

Slutkontroll: / **FINAL INSPECTION:** ☒ — Datum: / Date: 02/05/2023

Anordningen är utförd enligt ritning nr:

The pressure equipment conforms to drawing No.: 12294-4 rev2

Avvikelser / Deviation **:** ☒ Rev1 approved drawing, rev2 As Built - no technical changes, addition of serial no. and material cast number.

☐ Avvikelser se bilaga / Deviation see annex

Tryckkontroll: / **PROOF TEST:** ☒ — **Kalibrerad manometer:** / **Calibrated manometer:** ☒ — Datum: / Date: 02/05/2023

Rum / Chamber			1	2	3
Provtryck / Test pressure	PT	[bar]	23		
Tryckmedium / Fluid			Water		
Hålltid / Holding time		[min]	30		

Tillverkningsnummer / Manufacturing No.: 20935 (39403)		**Rapport nr.: /Test Report No.:**			**23119-IF-001 rev 1**
	Undersökningar, provningar och resultat/ EXAMINATIONS,TESTS AND RESULTS	Uppfylls Fulfilled	Ej till. Not applicable	Bilaga Annex	Anmärkningar Remarks
1.	Material: / Materials: EN-standard ☐, EAM ☐, Särskild utvärdering / Particular material appraisal ☒	☒	☐	☐	PMA-SA-352LCB rev04. Approved 28/04/2023
2.	Materialidentifiering Material traceability	☒	☐	☒	Cast no. 22M138 EU competent bodies confirmed.
3.	Intyg över tillsatsmaterial Records of welding consumables	☐	☒	☐	
4.	Svetsarprövning Qualification of welding personnel	☐	☒	☐	
5.	Svetsprocedurer Qualification of operating procedures	☐	☒	☐	
6.	Certifikat för OFP-personal/ Records of NDT personnel	☒	☐	☐	Casting quality only - Mr D K Anbalagan, ISO 9712, no RTP requirement to ESR 3.1.3
7.	OFP-rapporter NDT test reports	☒	☐	☐	Casting quality - MT0233report no. MT/KEL/001/2023.,
8.	Värmebehandlingsrapporter Heat treatment records	☐	☒	☐	
9.	Visuell kontroll / DImensionskontroll Visual examination / Dimensional check	☒			External. Internal as far as possible considering attached internals.
10.	Tillverkningsskylt Marking (name plate)	☒	☐	☒	As per drawing NPD 39403 rev1 (issued for manufacture)
11.	Riskanalys tillgänglig Hazard analysis was available	☒	☐		See design report 23119-01
12.	Bruksanvisning tillgänglig Operating instructions were available	☒	☐	☐	See design report 23119-01
13.	Försäkran om Överensstämmelse - utkast Declaration of Conformity - Draft	☒	☐	☒	

Resultat: / RESULT:

Ovanstående kontroller är utförda enligt direktivet 2014/68/EU och resulterade inte i några invändningar. Certifiering rekommenderas.
The aforementioned tests were carried out in accordance with Directive 2014/68/EU and did not result in any objections. Certification is recommended.

Markering / Marking Yes **på / on: märkskylt / name**plate ☒, **pos. /** pos. ☐,
Fläns / Flange ☐, **pos. 2; 2xInspection cover** ☐ pos.1

Ort: **Location:** Manchester, UK **Datum:** **Date:** 02/05/2023

TÜV NORD Scandinavia AB

Bilagor: Annexes: 39403 consisting of:-
1. Pressure test certificate, 2. Marking drawing, 3. Dec of Conformity,
4. Material test certificate

Anmält organ, id-nr 2529
Notified Body, Ident No. 2529

Ackred. nr. 5749
Produktcertifiering
ISO/IEC 17065

CERTIFICATE

(of conformity)

EU unit verification

according to directive 2014/68/EU

Certificate No.: TNSE-PED-23-277

Name and address of bearer/ manufacturer:	**Kelburn Engineering Ltd** **25 Hawbank Road, College Milton North** **East Kilbride, Glasgow, G74 5EG, UK**

We hereby certify that according to the results of the unit verification the pressure equipment mentioned below fulfills the requirements of directive 2014/68/EU. The pressure equipment is marked with

CE 2529

Tested according to 2014/68/EU:	**EU unit verification (module G)**
Test report No.:	**23119-IF-001 rev 1**
Description of pressure equipment:	**6" MK IV KS Coalescent Cyclone Separator (21063L)**
Serial number:	**20935**
Category:	**III**
Place of manufacture:	**Mill Hill Heavy Engineering Ltd, Spring Bank Mill** **Albert Street, Mill Hill, Blackburn BB2 4BL**

Date: 5th May 2023

Notified body for Pressure Equipment
TÜV NORD Scandinavia AB

Elektroniskt undertecknad av Martin Olsson
Datum: 2023.05.10 10:08:21 +02'00'

Martin Olsson

TÜV Nord Scandinavia AB
Gåsebäcksvägen 20
SE- 252 27 HELSINGBORG
Sweden

Notified body 2529

EU DECLARATION OF CONFORMITY

Issued in Accordance with the

PRESSURE EQUIPMENT DIRECTIVE 2014/68/EU

We declare under our sole responsibility that the following product complies with the requirements of Pressure Equipment Directive 2014/68/EU. The details of the pressure equipment as listed/described below.

Product Description: 6" MK IV KS Coalescent Cyclone Separator
Serial No(s) 20936

PED 2014/68/EU: Pressure Vessel, Group 1, Category IV, Module G

Manufacturer: Kelburn Engineering Ltd
25 Hawbank Road, East Kilbride, G74 5EG, United Kingdom

Notified Body: TÜV NORD Scandinavia AB
Gåsebäcksvägen 20, 252 27 Helsingborg, Sweden
Notified Body No. 2529

Applicable Standards: ASME BPVC II-DM, ASME BPVC VIII-1, ASME B16.5, ASME SA-352 Gr. LCB, and ISO 9001

Signed: _____

Name: Neil Bonner

Title: Quality Representative

Date: 28/04/2023

Rapport över bedömning av konstruktion /

Design Examination Report

Tillverkare: / Manufacturer: Kelburn Engineering Ltd 25 Hawbank Road East Kilbride Glasgow G74 5EG	**Uppdragsnummer /** Assignment No: 23119-02 **Referens** / Reference: 39404 **Order nummer** / Order number: 14424-NB-K

Förutsättningar / Test specifikation:

Föreskrift / Directive: **AFS 2016:1 /** 2014/68/EU

Standard / Technical specification, standards:

☐ DIN EN 13445 ☐ DIN EN 13480 ☐ DIN EN 12952 ☐ DIN EN 12953 ☐ AD2000

☐ ASME VIII,Div1 ☒ Annan/ Others: ASME VIII Div 1 (NCS)

Tryckbärande Anordning / Pressure Equipment described:

1 x 6" MK IV KS Coalescent Cyclone Separator (Pattern No. 21063H)

☒ **Tryckkärl /** Pressure vessel ☐ **Rörledning /** Piping

☐ **Säkerhetsutrustning /** Safety accesories ☐ **Tryckbärande tillbehör /** Pressure accesories

Kategori / / Category: **§8** ☐ **I** ☐ **II** ☐ **III** ☐ **IV** ☒

Modul/ Module: **G** ☒ **B Production type** ☐ **B Design type** ☐ **A2** ☐ **A** ☐

Granskad ritning / Reviewed drawing:

12295-4 Rev 1, 11660-1-39404 Rev 0

Rum / Chamber:		1	2	3
Beräkningstryck / Design pressure	**PS [bar]**	-1 / +60		
Beräkningstemperatur / Design temperature	**TS [°C]**	-45/+100		
Volym / Volume	**L**	47		
Fluid grupp / Fluid group		**1** ☒ **2** ☐	**1** ☐ **2** ☐	**1** ☐ **2** ☐
Nominell Diameter/ Nominel size	**DN**	-		

Ovanstående kontroller är utförda enligt direktivet 2014/68/EU och resulterade inte i några invändningar, under förutsättning att villkoren på sidan 2 uppfylls.

The design review was carried out in accordance with Directive 2014/68/EU and did not result in any objections, provided that the **requirements on pages 2** of the Design examination report are fulfilled.

Bilagor / Enclosures:

-

Datum / Date:

2023-04-28

Ort / Location:

Helsingborg

TÜV NORD Scandinavia AB

Elektroniskt undertecknad av Martin Olsson
Datum: 2023.04.28 16:18:49 +02'00'

Granskare/ Examiner: Martin Olsson

Anmält organ, id-nr 2529
Notified Body, Ident No. 2529

Rapport över bedömning av konstruktion /

Design Examination Report

Vilkor / Requirements		**Uppfyller ställda krav/** Meets the requirements		
		Ja / Yes	**Nej /** No	**NA**
Konstruktion/ Design:		☒	☐	☐
Material / Material:		☒	☐	☐
Svetsning / Welding:		☐	☐	☒
OFP – omfattning / NDT-amount:		☒	☐	☐
Utmattning / Fatigue:		☐	☐	☒
Externa laster / External loads:		☐	☐	☒
Krypning / Creep		☐	☐	☒

		Dokumentation finns/ Documents		
		Ja / Yes	**Nej /** No	**NA**
Riskanalys/ Hazard analysis		☒	☐	☐
Bruksanvisning / Operation manual		☒	☐	☐
WPS / WPS:		☐	☐	☒
WPQR / WPQR		☐	☐	☒

Kommentarer / Comments:

Anmärkningar / Remarks:

Slutkontroll av tryckbärande anordningar

Final assessment report for pressure equipment

Kontor / Test Laboratory: TÜV NORD SCANDINAVIA AB, Helsingborg	**Rapport nr.:** 23119-IF-002 / **Test report No.::**

Modul: / Module: G ☒ F ☐ BP ☐

Tillverkare: / Manufacturer:

Kelburn Engineering Ltd

25 Hawbank Road, East Kilbride

Glasgow, G74 5EG, UK

☒ **Tryckkärl** / **Vessel** ☐ **Säkerhetsutrustning** / **Safety accessories**

☐ **Rörledning** / **Piping** ☐ **Tryckbärande tillbehör** / **Pressure accessories**

Tillverkningsnummer.: / Manufacturing No.:	20936 (39404)	Kategori: / Category:	IV
Avsedd användning: / Application:	1-off 6" Mk IV KS Coalescent Cyclone Seperator (Pat No. 21063H)	Tillverkningsår: / Year of manufacture:	2023

Rum / Chamber			1	2	3
Min./max. Tryck / Min./max. allowable pressure	PS	[bar]	-1 to +60		
Min./max. Temperatur / Min./max. allowable temperature	TS	[°C]	-45 to +100		
Volym / Diameter / Volume / Nominal size	V/DN	[L/--]	47		
Fluid / Fluid			Hydrogen Gas		

Förutsättningar: / TEST SPECIFICATIONS:

Föreskrift: AFS 2016:1 Yes — Standarder / Standards: ASME VIII-1 (Non-Code Stamp)

Directive: 2014/68/EU

Avvikelser: / Nonconformities:

Tidigare kontroller: / PREVIOUS TESTS:

EU-typkontroll produktionstyp / EU type-examination production type ☐ Anmält organ: / Notified Body:

EU-typkontroll konstruktionstyp / EU type-examination design type ☐ Adress: / Address:

Kontroll av konstruktion / Examination of design ☒ Certifikat /Rapportnr.: / Certificate / Report No.: 23119-02 Datum: / Dated: 28/04/2023

Slutkontroll: / **FINAL INSPECTION:** ☒ Datum: / Date: 02/05/2023

Anordningen är utförd enligt ritning nr:

The pressure equipment conforms to drawing No.: 12295-4 rev2

Avvikelser / Deviation : ☒ Rev1 approved drawing, rev2 As Built - no technical changes, addition of serial no. and material cast number.

☐ Avvikelser se bilaga / Deviation see annex

Tryckkontroll: / **PROOF TEST:** ☒ **Kalibrerad manometer:** / **Calibrated manometer:** ☒ Datum: / Date: 02/05/2023

Rum / Chamber			1	2	3
Provtryck / Test pressure	PT	[bar]	86		
Tryckmedium / Fluid			Water		
Hålltid / Holding time		[min]	30		

Tillverkningsnummer / Manufacturing No.: 20936 (39404)		Rapport nr.: /Test Report No.:			23119-IF-002
	Undersökningar, provningar och resultat/ EXAMINATIONS,TESTS AND RESULTS	Uppfylls Fulfilled	Ej till. Not applicable	Bilaga Annex	Anmärkningar Remarks
1.	Material: / Materials: EN-standard ☐, EAM ☐, Särskild utvärdering / Particular material appraisal ☒	☒	☐	☐	PMA-SA-352LCB rev02. Approved 28/04/2023
2.	Materialidentifiering Material traceability	☒	☐	☒	Casting cast no. 22M138 S/Bolts cast no. 616040064 Nuts cast no. G190009864 EU competent body for casting confirmed.
3.	Intyg över tillsatsmaterial Records of welding consumables	☐	☒	☐	
4.	Svetsarprövning Qualification of welding personnel	☐	☒	☐	
5.	Svetsprocedurer Qualification of operating procedures	☐	☒	☐	
6.	Certifikat för OFP-personal/ Records of NDT personnel	☒	☐	☐	Casting quality only - Mr D K Anbalagan, ISO 9712, no RTPO requirement to ESR 3.1.3
7.	OFP-rapporter NDT test reports	☒	☐	☐	Casting quality - MT0286, report no. MT/KEL/001/2023.
8.	Värmebehandlingsrapporter Heat treatment records	☐	☒	☐	
9.	Visuell kontroll / DImensionskontroll Visual examination / Dimensional check	☒			External. Internal as far as possible considering attached internals.
10.	Tillverkningsskylt Marking (name plate)	☒	☐	☒	As per drawing NPD 39404 rev1 (issued for manufacture)
11.	Riskanalys tillgänglig Hazard analysis was available	☒	☐		See design report 23119-02
12.	Bruksanvisning tillgänglig Operating instructions were available	☒	☐	☐	See design report 23119-02)
13.	Försäkran om Överensstämmelse - utkast Declaration of Conformity - Draft	☒	☐	☒	

Resultat: / RESULT:

Ovanstående kontroller är utförda enligt direktivet 2014/68/EU och resulterade inte i några invändningar. Certifiering rekommenderas.
The aforementioned tests were carried out in accordance with Directive 2014/68/EU and did not result in any objections. Certification is recommended.

Markering / Marking Yes **på / on: märkskylt / name**plate ☒, **pos. /** pos. ☐,
Fläns / Flange ☐, **pos. 2; 2xInspection cover** ☐ pos.1

Ort: Location: Manchester, UK

Datum: Date: 02/05/2023

TÜV NORD Scandinavia AB

Anmält organ, id-nr 2529
Notified Body, Ident No. 2529

Bilagor: Annexes: 39404 consisting of
1. Pressure test certificate, 2. Marking drawing, 3. Dec of Conformity,
4. Casting material certificate

Ackred. nr. 5749
Produktcertifiering
ISO/IEC 17065

CERTIFICATE

(of conformity)

EU unit verification

according to directive 2014/68/EU

Certificate No.: TNSE-PED-23-278

Name and address of bearer/ manufacturer:	**Kelburn Engineering Ltd** **25 Hawbank Road, College Milton North** **East Kilbride, Glasgow, G74 5EG, UK**

We hereby certify that according to the results of the unit verification the pressure equipment mentioned below fulfills the requirements of directive 2014/68/EU. The pressure equipment is marked with

CE 2529

Tested according to 2014/68/EU:	**EU unit verification (module G)**
Test report No.:	**23119-IF-002**
Description of pressure equipment:	**6" MK IV KS Coalescent Cyclone Separator (21063H)**
Serial number:	**20936**
Category:	**IV**
Place of manufacture:	**Mill Hill Heavy Engineering Ltd, Spring Bank Mill** **Albert Street, Mill Hill, Blackburn BB2 4BL**

Date: 5th May 2023

Notified body for Pressure Equipment
TÜV NORD Scandinavia AB

Elektroniskt undertecknad av Martin Olsson
Datum: 2023.05.10 10:12:29 +02'00'

Martin Olsson

TÜV Nord Scandinavia AB
Gåsebäcksvägen 20
SE- 252 27 HELSINGBORG
Sweden

Notified body 2529

Customer:	**PETROTEL LUKOIL SA**
Equipment Description:	**6" MK IV KS Coalescent Type Cyclone Separators**
Quantity:	**2 Off**
Purchase Order:	**KEL105/24/11/2022**
Kelburn Job No.:	**39403/4**
Kelburn Description:	**6" MK IV KS Coalescent Type Cyclone Separator.**
Kelburn Serial Nos.:	**20935 & 20936**

Section 6: Kelburn Certificate of Conformity.

39403 Certificate of Conformity.
39404 Certificate of Conformity.

KELBURN ENGINEERING LTD

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Website: www.kelburneng.co.uk

39403

Job No: 39403

PETROTEL LUKOIL SA
Romania

CERTIFICATE OF CONFORMITY

This is to certify that the 6” MK IV KS Coalescent Type Cyclone Separator has been inspected by Kelburn Engineering Limited and is supplied in full conformity with your purchase order and specifications related there to.

PO No.: Separator Type:	KEL105/24.11.2023
Nominal Bore:	6” MK IV KS
Kelburn Serial No:	150mm
Year of Manufacture:	20935
Maximum allowable Working pressure:	2023
Maximum Allowable Working Temperature:	16 barg
Minimum Allowable Working Temperature:	70°C
Hydraulic Test Pressure:	-45°C
Casting Material Heat No:	23 bar
	22M138

Signed 02/05/2023

Scott Bradley
Kelburn Engineering Limited

KELBURN ENGINEERING LTD

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East Kilbride
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G74 5EG
UK

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Website: www.kelburneng.co.uk

39404

Job No: 39404

PETROTEL LUKOIL SA
Romania

CERTIFICATE OF CONFORMITY

This is to certify that the 6” MK IV KS Coalescent Type Cyclone Separator has been inspected by Kelburn Engineering Limited and is supplied in full conformity with your purchase order and specifications related there to.

PO No.:	KEL105/24.11.2023
Separator Type:	6” MK IV KS
Nominal Bore:	150mm
Kelburn Serial No:	20936
Year of Manufacture:	2023
Maximum allowable Working pressure:	86 barg
Maximum Allowable Working Temperature:	100°C
Minimum Allowable Working Temperature:	-45°C
Hydraulic Test Pressure:	86 bar
Casting Material Heat No:	22M138

Signed 02/05/2023

Scott Bradley
Kelburn Engineering Limited

Customer:	**PETROTEL LUKOIL SA**
Equipment Description:	**6" MK IV KS Coalescent Type Cyclone Separators**
Quantity:	**2 Off**
Purchase Order:	**KEL105/24/11/2022**
Kelburn Job No.:	**39403/4**
Kelburn Description:	**6" MK IV KS Coalescent Type Cyclone Separator.**
Kelburn Serial Nos.:	**20935 & 20936**

Section 7: Installation, Operating and Maintenance Instructions.

Installation, Operating and Maintenance Instructions of Kelburn MK II KS and MK IV KS Type Cyclone Separators.

Installation, Operating and Maintenance Instructions.

Of

Kelburn MK II KS and MK IV KS Type Cyclone Separators.

KELBURN ENGINEERING LIMITED
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This instruction manual must be read by all personnel who are responsible for installation, operating and maintenance of the following described equipment.

Table of Contents

1. Introduction.

Kelburn Cyclone Separators, when properly installed, drained and commissioned as per these instructions, are designed to remove liquid droplets, liquid mist and particulates from compressed air and gas flows. If unsure about the selection and suitability of Kelburn Cyclone Separators contact Kelburn Engineering Limited for confirmation.

WARNING!

To ensure continuing good performance and safe operation of the Cyclone Separator, everyone concerned with its installation, use and maintenance must carefully follow the instructions given in these instructions.

Please refer to the data plate attached to the Kelburn Cyclone Separator which states the maximum allowable operating pressure and temperature, the end user must ensure that suitable devices are fitted to prevent these from being exceeded

When the ambient temperature is lower than the minimum design temperature for the vessel. The vessel will require warming before any pressure can be applied.

The use of replacement parts other than those supplied by Kelburn Engineering Limited may cause failure of the Cyclone Separator, property damage or serious personal injury. Therefore, Kelburn Engineering Limited accepts no responsibility for the consequences of use of Kelburn Engineering equipment containing non-approved parts.

Kelburn Engineering Limited Cyclone Separators comply with the requirements of the European Pressure Equipment Regulations 2014/68/EU and will carry the CE mark on the Cyclone Separator data plate when and where required.

Kelburn Engineering Limited Cyclone Separators comply with the requirements of the Pressure Equipment Safety Regulations 2016 and will carry the UKCA mark on the Cyclone Separator data plate when and where required.

Kelburn Engineering Limited recommends all Kelburn Cyclone Separators, and ancillary equipment, installed in pipes carrying steam or high temperature gases for process, when exposed to contact and located within two (2) metres of the floor or working platform shall be covered with a heat-insulating material, or otherwise properly guarded.

2. Receiving and Inspection.

Immediately upon receipt of the Cyclone Separator, check for damage that may have occurred during shipping. If there is any damage, do not install or attempt to repair the Cyclone Separator. File a claim with the shipping company and contact Kelburn Engineering Limited for further instructions. Since the Cyclone Separator is shipped ex-works (unless otherwise agreed), UK address, the carrier is legally responsible for shipping damage. Such damage is not covered by the Cyclone Separator warranty.

3. Installation / Checklist for Cyclone Separators.

3.1 Ensure that there is suitable access and lifting equipment to be able to work safely during the Cyclone Separator installation.

3.2 If the Cyclone Separator is being installed into an existing pipework system, ensure that the pipe where the Cyclone Separator is being installed has been properly isolated, drained and vented in accordance with site regulations. Always allow for high temperature pipework to cool down before Cyclone Separator installation.

3.3 All persons responsible for the installation of Cyclone Separators should wear protective clothing in accordance with site requirements.

3.4 Manual handling of Cyclone Separators is not recommended, suitable lifting equipment should be used at all times to prevent damage to equipment or injury to personnel.

3.5 Please refer to the nameplate (Figure 1 or Figure 3) attached to the Cyclone Separator which states the maximum allowable pressure (MAP), maximum temperature (MaxT) and minimum temperature (MinT). The end user must ensure that suitable devices are fitted to prevent these pressure and temperatures from being exceeded.

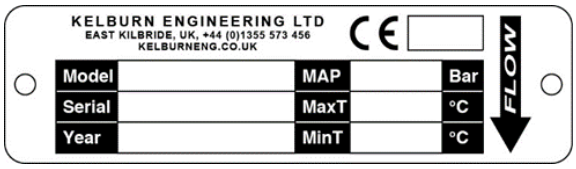

Figure 1
CE Marked Cyclone Separator Nameplate

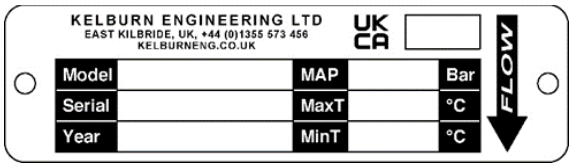

Figure 2
UKCA Marked Cyclone Separator Nameplate

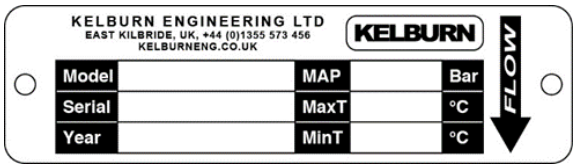

Figure 3
Cyclone Separator Nameplate

4. MK II KS & MK IV KS Coalescent Cyclone Separator Installation.

4.1. The MK II KS or MK IV KS Cyclone Separator must be installed horizontally, as illustrated in Fig. A below. The drain leg angle on Table B below can be achieved by ensuring that the directional flow arrow, on the nameplate, is situated on top of the Cyclone Separator when mounted in a horizontal pipe run.

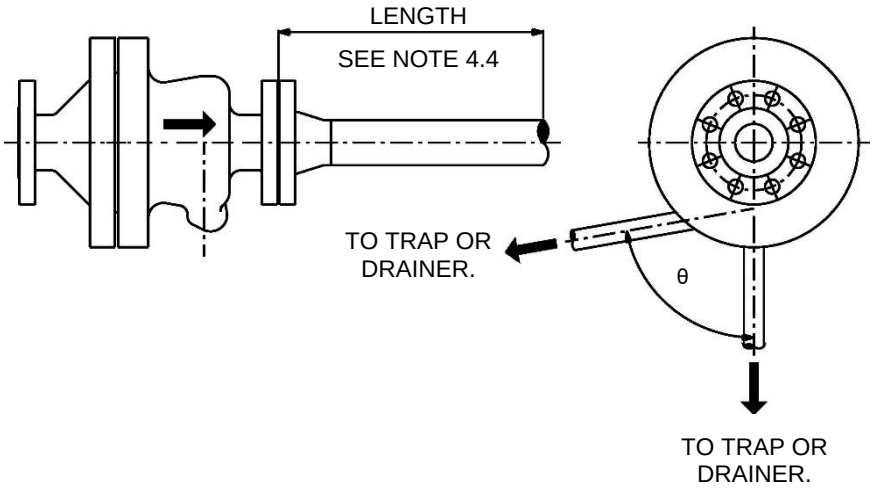

Figure A.

MK II KS TYPE									
SEPARATOR SIZE	¼" (DN10)	½" (DN15)	¾" (DN20)	1" (DN25)	1½" (DN40)	2" (DN50	3" (DN80)	4" (DN100)	5" (DN125)
DRAIN ANGLE θ	0°	0°	80°	80°	80°	80°	0°	0°	0°

MK IV KS TYPE					
SEPARATOR SIZE	6" (DN150)	8" (DN200)	10" (DN250)	12" (DN300)	15" (DN350)
DRAIN ANGLE θ	0°	0°	0°	0°	0°

Table B.

4.2. MK II KS and MK IV KS Cyclone Separators with flanged inlet and outlet connections must be bolted in position with correctly sized bolting. The tightening of bolting must be in accordance with recommended tightening torques for gasket type and thread form.

4.3 Ensure that the female threads on MK II KS and MK IV KS Cyclone Separators with tapped inlet, outlet and drain connections are thoroughly cleaned before installing into a pipe run. Please ensure a suitable thread sealant is used when installing a Cyclone Separator with tapped inlet and outlet connections.

4.4 For optimum separation efficiency Kelburn Engineering recommend a straight length of pipe directly downstream of the Cyclone Separator outlet connection. The ideal length should be equal to 12x the nominal bore of the Cyclone Separator outlet connection. At the very least, the recommended straight length of pipe can be 8x the Cyclone Separator outlet connection. Ideally no valves or instrumentation should be fitted within the recommended straight length of pipe downstream of the Cyclone Separator. If a straight length of pipe is not possible due to site conditions, please consult Kelburn Engineering for alternative recommendations. No straight length of pipe is required upstream of the Cyclone Separator.

4.5 Where automatic collection or discharge of the separated liquid is required, a suitable trap, or drainer and valves must be installed. To obviate any chance of air locking in the drain line to the trap or drainer, the drain line bore should be equal to the Cyclone Separator drain size. Any trap, drainer or valve installed on the drain system must be installed in accordance with manufacturer's standard installation instructions. Any trap, drainer or valves installed must be included in a maintenance programme. A suitable drain configuration for individual applications can be supplied, on request.

5. Commissioning.

Kelburn Engineering Limited Cyclone Separators when properly installed do not require any commissioning. Any instrumentation, alarms, control equipment installed upstream or downstream of the Cyclone Separator should be commissioned as per manufacturer's recommendations.

6. Operating Instructions.

The Kelburn MK II KS, MK IV KS and KSS Cyclone Separators have no moving parts and when installed correctly do not require any operating procedures.

7. MK II KS & MK IV KS Coalescent Cyclone Separator Maintenance Instructions.

7.1 The Kelburn MK II KS and MK IV KS Coalescent Cyclone Separators are low maintenance items and do not require a regular maintenance programme. Any control equipment installed on the drainage system of the Cyclone Separator must be included in a routine maintenance programme. Please refer to the control equipment manufacturer's standard maintenance procedures for guidelines.

7.2 Kelburn Engineering Limited recommends that all Cyclone Separators should be periodically inspected during any major plant maintenance downtime. Reasonable care and attention should be taken when removing the Cyclone Separator from an existing pipeline ensuring that the cyclone separator is properly supported before the loosening of the cyclone separator takes place.

7.3 Once removed from the pipeline, the Cyclone Separator must be placed on a suitable surface to protect and avoid any damage to the machined surfaces. Special attention should be taken to protect all flange raised faces as any damage to raised faces may result in the flange-to-flange surface not resealing after re-installation.

7.4 Once removed from the pipeline the Cyclone Separator should be visually inspected in a well-lit area. The person responsible for inspecting the Cyclone Separator should also use adequate illumination for inspecting the Cyclone Separator internally. The Cyclone Separator should be inspected as per the following instructions:

A. Inspect all separator surfaces against corrosion and wear, special attention should be taken to inspect the separator deflector making sure that the deflector vanes are not blocked. Any blocked vanes should be manually cleaned if possible.
B. Inspect the stainless steel agglomerator plates against blockages. Any blockages should be removed by manual force or by blasting with compressed air.
C. Inspect the separator drain outlet making sure that the outlet is clean and clear of any build up of separated particles.
D. On satisfactory inspection, the Cyclone Separator should be thoroughly cleaned by hand and blown down with compressed air to remove any loose dirt or dust particles.

NOTE:

Kelburn Engineering Limited strongly recommend that any Cyclone Separator installed in a high temperature installation for a minimum period of 100,000 operating hours is subjected to appropriate in-service monitoring.

7.5 On satisfactory inspection and maintenance, the Cyclone Separator should be re-installed as per the standard installation procedures for Kelburn MK II KS and MK IV KS Type Cyclone Separators.

8. SPARE PARTS.

Kelburn Engineering Limited does not recommend any spares parts for Cyclone Separator’s.