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Compartimento della Viabilità per la Calabria

LAVORI DI ADEGUAMENTO DELLA S.S. 534 COME RACCORDO AUTOSTRADALE CAT. B - MEGALOTTO 4

Collegamento tra l'Autostrada A3 (Svincolo di Firmo) e la S.S. 106 Jonica (Svincolo di Sibari)

PROGETTO ESECUTIVO

ELABORATI COSTRUTTIVI

Impresa Esecutrice

intercantieri VITTADELLO

Via Pierobon, 46 - 35010 LIMENA (PD)
Tel. 049 8657311 - Fax 049 767984
info@intercantieri.com

DIRETTORE TECNICO e PROCURATORE
Ing. D. Pangallo

RESPONSABILE UNICO DEL PROCEDIMENTO	DIRETTORE DEI LAVORI	COORDINATORE DELLA SICUREZZA IN FASE DI ESECUZIONE	COLLAUDATORE
Ing. G. Luongo	Ing. S. Rigoli	Ing. G. Scorzafave	

PROGETTO ESECUTIVO PER APPALTO INTEGRATO REDATTO DALL'ATP
(Approvato in data 04/11/2013 con provvedimento del Presidente ANAS prot. CDG-0140703-P in attuazione alla delibera del Consiglio di Amministrazione n.33 del 28/10/2013)

Mandataria: LSTI ingegneria
Mandante: F&M favero&milan ingegneria
Mandante: i2 Ingegneria delle Infrastrutture

PROGETTAZIONE DI DETTAGLIO E/O PERIZIA DI VARIANTE REDATTA DALL'ATI

Imprese
Mandataria: VIDONI
Mandante: GRECALE

Progettazione
SISt
ViA
WAY B
Ing. Geotecnico Dott. Ing. Luigi Tripodi
sepi s.r.l.

MONITORAGGIO AMBIENTALE

RESPONSABILE AMBIENTALE
Dott. Geol. Anna Viceconte

ORDINE DEI GEOLOGI PUGLIA – geologo ANNA VICECONTE N. 426

Esecuzione dei rilievi

ORDINE DEI GEOLOGI REGIONE CALABRIA – DOTT. GEOLOGO ALESSANDRO CRISPINO SEZ. A/B N° 530

RESPONSABILE DEI RILIEVI
Dott. Geol. Alessandro Crispino

TITOLO ELABORATO:

PIANO DI MONITORAGGIO AMBIENTALE
Corso d'Opera
Rilievi Componente Atmosfera: Trimestre Aprile-Giugno 2017

CODICE ELABORATO:

LAVORO	FASE	SUBFASE	TIPO	ELABORATO	REVISIONE
CCS242	AM	01	D	017984	R00

SCALA: --

rev.	data	descrizione	redatto	verificato	controllato	approvato
00	30 06 17	Prima emissione	Pettinato	Grispino	Viceconte	Pangallo
01	-- -- --	---	--	--	--	--
02	-- -- --	---	--	--	--	--
03	-- -- --	---	--	--	--	--
04	-- -- --	---	--	--	--	--

Sommario

1. PREMESSA

Nella presente relazione, sono riportati i risultati delle misurazioni atmosferiche eseguite nel trimestre Aprile-Giugno 2017 dalla ditta HYpro s.r.l. nell'ambito del Piano di Monitoraggio Ambientale approvato per i lavori di adeguamento della S.S. 534 come raccordo autostradale – CAT.B – Megalotto 4 "Collegamento tra l'Autostrada A3 (svincolo di Firmo) e la S.S. 106 Jonica (svincolo di Sibari).
La definizione trimestre Aprile-Giugno 2017, quale periodo di riferimento delle attività di monitoraggio del presente elaborato, è consequenziale alle lavorazioni in atto ed alla loro durata.

Nel caso specifico, il Cronoprogramma pianificava un solo rilievo per la stazione ATM_09, da eseguirsi nel mese di aprile. In base all'andamento delle lavorazioni in corso, la campagna di rilievi è stata ampliata nel mese di aprile anche alle stazioni ATM_08, ATM_10 e ATM_11. Nel mese di maggio sono stati eseguiti rilievi nelle medesime stazioni monitorate ad aprile, mentre a giugno è stata monitorata la sola stazione ATM_02 in concomitanza delle lavorazioni più significative di quel periodo (realizzazione terre armate su CS02/VI01 e CV01).

Il Responsabile Ambientale nominato per la gestione del monitoraggio ambientale è la Dott. Geol. Anna Viceconte. La ditta esecutrice dei rilievi è la Hypro s.r.l., è organizzata mediante una struttura formata dal suo Responsabile dei Rilievi, il Dott. Geol. Alessandro Grispino, mentre per lo svolgimento delle attività di monitoraggio ambientale in fase Corso d'Opera si è avvalsa delle seguenti figure:

- Responsabile di Settore (RS) — Dott. Geol. Alessandro Grispino
- Responsabile di Laboratorio (RL) — Dott. Giovanni Misasi
- Responsabile di Laboratorio (RL) — Ing. Raffaele Didonna
- Assistente di campo (AC) — Dott. Geol. Giuseppe Pettinato

I rilievi eseguiti sulla stazione ATM02, sono stati effettuati dalla Emonitoring s.r.l. per conto della Hypro s.r.l.

2. NORMATIVA DI RIFERIMENTO

Normativa comunitaria

- **Direttiva Parlamento europeo e Consiglio Ue 2008/50/Ce**
- **Direttiva 2004/107/Ce**

- **Direttiva Parlamento europeo e Consiglio Ue 2002/3/Ce Ozono nell'aria** - Testo consolidato
- **Direttiva Parlamento europeo e Consiglio Ue 2001/81/Ce**
- **Direttiva Parlamento europeo e Consiglio Ue n. 2000/69/Ce**
- **Direttiva Consiglio Ue 1999/30/Ce** Valori limite qualità dell'aria ambiente per biossido di zolfo, biossido di azoto, ossidi di azoto, piombo
- **DIRETTIVA 96/62/CE DEL CONSIGLIO del 27 settembre 1996** in materia di valutazione e di gestione della qualità dell'aria ambiente

Normativa Nazionale

- **D. Lgs. 24/12/2012 n.250,** Modifiche ed integrazioni al Decreto Legislativo 13 Agosto 2010, n.155, recante attuazione della Direttiva 2008/50/CE relativa alla qualità dell'aria ambiente e per un'aria più pulita in Europa.
- **DECRETO LEGISLATIVO 155/2010 e s.m.i.:** Attuazione della Direttiva Europea 2008/50/Ce
- **DECRETO LEGISLATIVO 26 giugno 2008, n.120:** Modifiche ed integrazioni al decreto legislativo 3 agosto 2007, n. 152, di attuazione della direttiva 2004/107/CE relativa all'arsenico, il cadmio, il mercurio, il nichel e gli idrocarburi policiclici aromatici nell'aria ambiente.
- **Decreto legislativo 3 agosto 2007, n. 152:** Attuazione della direttiva 2004/107/Ce concernente l'arsenico, il cadmio, il mercurio, il nichel e gli idrocarburi policiclici aromatici nell'aria ambiente.
- **Dlgs 3 aprile 2006, n. 152 s.m.i.:** Testo unico ambientale: Norme in materia di tutela dell'aria e di riduzione delle emissioni in atmosfera.
- **Dlgs 21 maggio 2004, n. 171**: Attuazione della direttiva 2001/81/Ce relativa ai limiti nazionali di emissione di alcuni inquinanti atmosferici (biossido di zolfo, ossidi di azoto, componenti organici volatili, ammoniaca).
- **Dlgs 21 maggio 2004, n. 183**: Ozono nell'aria - Attuazione della direttiva 2002/3/Ce
- **Dm Ambiente 1 ottobre 2002, n.261:** Direttive tecniche per la valutazione della qualità dell'aria ambiente - Elaborazione del piano e dei programmi di cui agli articoli 8 e 9 del Dlgs 351/1999

- **Dm Ambiente 20 settembre 2002**: Attuazione dell'articolo 5 della legge 28 dicembre 1993, n. 549, recante misure a tutela dell'ozono stratosferico
- **Dm Ambiente 2 aprile 2002, n. 60**: Sostanze inquinanti dell'aria - Valori limite di qualità dell'aria ambiente. Recepimento della direttiva 1999/30/CE del Consiglio del 22 aprile 1999
- **Dm Ambiente 25 agosto 2000**: Metodi di campionamento, analisi e valutazione degli inquinanti - Dpr 203/1988
- **Dlgs 4 agosto 1999, n. 351**: Attuazione della direttiva 96/62/Ce sulla qualità dell'aria
- **Decreto direttoriale MinAmbiente 1° luglio 2005, n. 854**: Linee guida per il monitoraggio e la comunicazione delle emissioni di gas a effetto serra - Attuazione decisione 2004/156/Ce
- **Decreto Ministeriale 16 maggio 1996**: Attivazione di un sistema di sorveglianza di inquinamento da ozono.
- **D.M. 25 novembre 1994**: Aggiornamento delle norme tecniche in materia di limiti di concentrazione e di livelli di attenzione e di allarme per gli inquinamenti atmosferici nelle aree urbane e disposizioni per la misura di alcuni inquinanti di cui al decreto ministeriale 15 aprile 1994 (2)
- **D.M. 15 aprile 1994**: Norme tecniche in materia di limiti di concentrazione e di livelli di attenzione e di allarme per gli inquinanti atmosferici nelle aree urbane ai sensi degli articoli 3 e 4 dpr 203 del 24 maggio 1988 e del dm 20 maggio 1991 art 9 in particolare si modificano livelli di allarme per l'ozono
- **D.M. 20 maggio 1991**: Criteri per la raccolta dei dati inerenti la qualità dell'aria
- **Dpcm 21 luglio 1989**: Attuazione e interpretazione del Dpr 203/1988 - Testo consolidato
- **Dpr 24 maggio 1988, n. 203**: Emissioni in atmosfera. Norme in materia di qualità dell'aria relativamente a specifici agenti inquinanti e di inquinamento prodotto da impianti industriali.
- **D.P.C.M. 28 marzo 1983**: Limiti massimi di accettabilità delle concentrazioni e di esposizione relativi ad inquinanti dell'aria nell'ambiente esterno.

3. PUNTI DI MONITORAGGIO

I punti di monitoraggio sono riportati nella tabella di seguito riportata.

Codice monitoraggio	Tipo di Misura	Luogo di misura	Durata delle misure
ATM_02	Misura Totali	Agglomerato industriale/commerciale presso la pk 0+300	14 gg
ATM_08	Misura Polveri	Sito di deposito intermedio – S1	7 gg
ATM_09	Misura Polveri	Sito di deposito – S2	7 gg
ATM_10	Misura Polveri	Sito di deposito – S4	7 gg
ATM_11	Misura Polveri	Sito di deposito intermedio – S3	7 gg

4. STRUMENTAZIONE IMPIEGATA

La strumentazione utilizzata per il monitoraggio in corso d'opera si compone di apparecchiature mobili. Le stazioni di rilevamento sono organizzate in tre blocchi principali:

- Analizzatori/campionatori automatici per la valutazione degli inquinanti aerodispersi;
- Centralina per la valutazione dei parametri meteorologici;
- Unità di acquisizione ed elaborazione dati.

Campionatore Dustcheck5	
Campionatore AirCube Com2	
Campionatore CF20	

Stazione Meteorologica DAVIS VANTAGE PRO2 WIRELESS	

Le attrezzature sopra descritte, sono riferite ai rilievi effettuati presso le stazioni ATM08, ATM09, ATM10 e ATM11. Le metodologie utilizzate per i campionamenti e previste dalla normativa nazionale e comunitaria, vengono elencate nella tabella di seguito.

Sostanza	Metodo di prova
Polveri PM_{10}	UNI EN 12341 "Qualità dell'aria. Determinazione del particolato in sospensione PM10. Metodo di riferimento e procedimento per prove in campo atte a dimostrare l'equivalenza dei metodi di misurazione rispetto al metodi di riferimento"
Polveri $PM_{2,5}$	UNI EN 14907:2005 "Qualità dell'aria ambiente. Metodo normalizzato di misurazione gravimetrico per la determinazione della frazione massima PM2,5 del particolato in sospensione".

Oltre a quanto sopra illustrato per il rilevamento delle polveri, è stata utilizzata nella stazione ATM02 la seguente strumentazione:

Thermo Scientific TEOM 1405-DF **Analizzatore del particolato atmosferico**	
Thermo Scientific Model 42i **Analizzatore ossidi di azoto**	
Thermo Scientific Model 43i **Analizzatore di anidride solforosa**	
Thermo Scientific Model 48i **Analizzatore di monossido di carbonio**	
AMA Instruments GC 5000 series **Analizzatore per BTX**	

Thermo Scientific Model 49i **Analizzatore di ozono**	
Mega System LIFETEK PMS **Campionatore sequenziale particolato fine**	

Le metodologie utilizzate per i campionamenti sull'ATM02, previste dalla normativa nazionale e comunitaria, vengono elencate nella tabella di seguito:

Sostanza	Metodo di prova
Polveri PM_{10}	UNI EN 12341 "Qualità dell'aria. Determinazione del particolato in sospensione PM10. Metodo di riferimento e procedimento per prove in campo atte a dimostrare l'equivalenza dei metodi di misurazione rispetto al metodi di riferimento"
Polveri $PM_{2,5}$	UNI EN 14907:2005 "Qualità dell'aria ambiente. Metodo normalizzato di misurazione gravimetrico per la determinazione della frazione massima PM2,5 del particolato in sospensione".
SO_2	UNI EN 14212:2005 "Qualità dell'aria ambiente. Metodo normalizzato per la misurazione della concentrazione di diossido di zolfo mediante fluorescenza ultravioletta".
NO-NO_2-NOx	UNI EN 14211 "Qualità dell'aria ambiente. Metodo normalizzato per la misurazione della concentrazione di diossido di azoto e monossido di azoto mediante chemiluminescenza".
CO	UNI EN 14626:2005 "Qualità dell'aria ambiente. Metodo normalizzato per la misurazione della concentrazione di monossido di carbonio mediante spettroscopia a raggi infrarossi non dispersiva"
O_3	UNI EN 14625:2005 "Qualità dell'aria ambiente. Metodo normalizzato per la misurazione della concentrazione di ozono mediante fotometria ultravioletta"
Benzene	UNI EN 14662:2005 "Qualità dell'aria ambiente. Metodo normalizzato per la misurazione della concentrazione di benzene"

Sostanza	Metodo di prova
Metalli pesanti	UNI EN 14902:2005 "Qualità dell'aria ambiente. Metodo normalizzato per la misurazione di Pb, Cd, As e Ni nella frazione PM10 del particolato in sospensione"

5. SCHEDE DI MONITORAGGIO

Le schede compilate durante il monitoraggio, riportano in corrispondenza dei punti di misura, le indicazioni relative a:

- ✓ comune,
- ✓ località,
- ✓ immagine satellitare ubicazione punto di misura,
- ✓ coordinate geografiche del punto di misura
- ✓ accesso al punto di monitoraggio,
- ✓ tipologia misura,
- ✓ distanza dalla sede stradale;
- ✓ sorgente inquinanti esistenti;
- ✓ grafici delle principali sostanze inquinanti

Ogni scheda di misura riporta inoltre fotografie per testimoniare l'ubicazione della strumentazione in fase di rilievo ed al fine di riconoscere e riallestire i punti di misura delle diverse fasi temporali in cui si articola il programma di monitoraggio.

6. CONCLUSIONI

La valutazione della qualità dell'aria durante le lavorazioni, è stata effettuata confrontando i dati acquisiti in cantiere durante la campagna di rilievi, con i limiti di legge riportati negli Allegati del Dlgs 155/2010 e s.m.i., e sintetizzati nei paragrafi successivi.

6.1 Rilievi di Aprile 2017

Sostanza	Valore limite	Stazioni di monitoraggio			
		ATM_08	ATM_09	ATM_10	ATM_11
Polveri PM_{10}	50 µg/m³ (valore medio giornaliero)	Non superato	Non superato	Non superato	Non superato

Durante la fase di monitoraggio non sono stati rilevati dei superamenti della concentrazione limite giornaliera per il PM_{10}.

I livelli di polveri inalabili $PM_{2.5}$ hanno evidenziato nei giorni di campionamento una concentrazione media ed un valore massimo di concentrazione, pari a:

Sostanza	Stazioni di monitoraggio							
	ATM_08		ATM_09		ATM_10		ATM_11	
	Medio	Max	Medio	Max	Medio	Max	Medio	Max
Polveri $PM_{2.5}$	6,8	11	14,8	20,3	23,9	32,9	9,5	21,8

I valori campionati non sono stati confrontati con il limite normativo in quanto i campioni raccolti sono relativi a soli 7 giorni di monitoraggio mentre il limite di 25 µg/m³ è fissato come media sull'anno civile dei valori giornalieri (All. XI del D.Lgs 155/2010 e ss.mm.ii.).

6.2 Rilievi di Maggio 2017

Sostanza	Valore limite	Stazioni di monitoraggio			
		ATM_08	ATM_09	ATM_10	ATM_11
Polveri PM_{10}	50 µg/m³ (valore medio giornaliero)	Non superato	Non superato	Non superato	Non superato

Durante la fase di monitoraggio non sono stati rilevati dei superamenti della concentrazione limite giornaliera per il PM_{10}.

I livelli di polveri inalabili $PM_{2.5}$ hanno evidenziato nei giorni di campionamento una concentrazione media ed un valore massimo di concentrazione, pari a:

Sostanza	Stazioni di monitoraggio							
	ATM_08		ATM_09		ATM_10		ATM_11	
	Medio	Max	Medio	Max	Medio	Max	Medio	Max
Polveri $PM_{2.5}$	1,3	2,3	2,6	13,4	3,3	4,9	7,7	11,3

I valori campionati non sono stati confrontati con il limite normativo in quanto i campioni raccolti sono relativi a soli 7 giorni di monitoraggio mentre il limite di 25 µg/m³ è fissato come media sull'anno civile dei valori giornalieri (All. XI del D.Lgs 155/2010 e ss.mm.ii.).

6.3 Rilievi di Giungo 2017

Dall'esame dei risultati ottenuti, è possibile trarre le conclusioni qui di seguito esposte (Si vedano le tabelle allegate).

Le concentrazioni del PM10 rilevate durante l'intero periodo di osservazione sono state confrontate con il valore limite giornaliero di riferimento, stabilito dal D.Lgs 155/2010 e ss.mm.ii., pari a 50 µg/m3 da non superare più di 35 volte nell'anno. I risultati del monitoraggio, riportati nelle schede allegate, evidenziano il rispetto dei limiti vigenti per tutta la campagna di misura.

Per quanto concerne le concentrazioni di PM2,5, non si evidenziano aspetti significativi. L'andamento delle concentrazioni ricalca in buona sostanza quello del PM10. I valori campionati non sono stati confrontati con il limite normativo in quanto i campioni raccolti sono relativi a soli 7 giorni di monitoraggio mentre il limite di 25 µg/m³ è fissato come media sull'anno civile dei valori giornalieri (All. XI del D.Lgs 155/2010 e ss.mm.ii.).

Il D.Lgs 155/2010 e ss.mm.ii stabilisce per l'ozono due valori soglia:

- informazione: 180 µg/m³ su un periodo di mediazione di 1 ora
- allarme: 1 ora 240 µg/m³ su un periodo di mediazione di 1 ora

Come si evince dai certificati allegati, i valori soglia non sono stati superati.

Il D. Lgs. 155/2010 e ss.mm.ii., prevede quale riferimento il Biossido di Azoto con un valore limite di 200 µg/m³, con periodo di mediazione di 1 ora, da non superare più di 18 volte per anno civile e, sempre per l'NO_2, prevede un limite di 40 µg/m³, con periodo di mediazione pari ad un anno civile. Dai dati della campagna, si evince che le misure non hai mai superato le concentrazioni di 200 e 40 µg/m³.

Il suddetto decreto stabilisce, inoltre, i livelli critici dell'NO_x per la protezione della vegetazione pari a 30 µg/m³, come livello critico annuale (anno civile).

Per quanto concerne il Benzene, il D.Lgs. 155/2010 ss.mm.ii, fissa come valore limite per la protezione della salute umana una concentrazione media annuale pari a 5 µg/m³, non confrontabile con dati raccolti relativi a soli 14 giorni di monitoraggio.

Per quanto riguarda il monossido di carbonio CO, il limite normativo stabilito dal D.Lgs.155/2010 ss.mm.ii, come media massima giornaliera calcolata su 8 ore, è pari a 10 mg/m³, il quale non è mai stato superato.

Il D.Lgs 155/2010 ss.mm.ii., prevede quale riferimento per il SO_2 un valore limite di 350 µg/m³, con un periodo di mediazione di 1 ora, da non superare più di 24 volte per anno civile e di 125 µg/m³, con un periodo di mediazione pari ad un giorno, da non superare più di 3 volte per l'anno civile. Dai dati della campagna si evince che le misure non hanno mai superato le concentrazioni di 125 e 350 µg/m³.

Il D.Lgs 155/2010 ss.mm.ii., prevede quale riferimento per il Piombo un valore limite di 0,5 µg/m³, con un periodo di mediazione pari ad un anno civile. Si evince che le misure non hanno mai superato le concentrazioni di 0,5 µg/m³.

Quanto rilevato in questa fase ha avuto lo scopo di monitorare lo stato della qualità dell'aria nel periodo di tempo relativo al trimestre Aprile-Giugno 2017, durante le fasi lavorative per la realizzazione dell'opera stradale.

Il Responsabile di Settore
Dott. Geol. Grispino Alessandro

ALLEGATI

- **Schede di Misura**
- **Schede tecniche e certificati di taratura/calibrazione**

RILIEVI DI APRILE 2017

SCHEDA PUNTO DI MISURA ATM 08

COORDINATE DI RIFERIMENTO: 16°15'06"E, 39°43'24"N

Fase di monitoraggio: Corso d'opera	Codice misura: ATM_08

LOCALIZZAZIONE GEOGRAFICA	
Località: Cammarata Comune: Castrovillari Provincia: Cosenza Regione: Calabria Distanza dal tracciato: 5 m Pk: 1+040,00	Accesso al punto di misura: Il punto è ubicato all'interno dei un sito di deposito a servizio del cantiere Sorgenti esistenti: Attività agricole

PARAMETRI MISURATI				
PARAMETRO	METODO DI MISURA	COORDINATE		CODICI CAMPIONE
PM_{10}	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
$PM_{2,5}$	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
CO		X:Vedi sopra	Y: Vedi sopra	NA
NO		X:Vedi sopra	Y: Vedi sopra	NA
NO_2		X:Vedi sopra	Y: Vedi sopra	NA
C_6H_6		X:Vedi sopra	Y: Vedi sopra	NA
O_3		X:Vedi sopra	Y: Vedi sopra	NA
SO_2		X:Vedi sopra	Y: Vedi sopra	NA
Analisi metalli				
Parametri Meteo	DV – VV – RAD – UR – PIOGGIA – T - PRESS			

SORGENTI INQUINANTI NON CONNESSE CON L'INFRASTRUTTURA
Attività agricole

NOTE
Le lavorazioni in corso sono rappresentate da movimento terra

Operatore:	G. Pettinato

ANALISI CHIMICHE

DATA (gg/mm/aaaa)	$PM_{2,5}$ [µg/m^3]	PM_{10} [µg/m^3]	CO [µg/m^3]	NO [µg/m^3]	NO_2 [µg/m^3]	C_6H_6 [µg/m^3]	O_3 [µg/m^3]
03/04/2017	0,0	0,0	NA	NA	NA	NA	NA
04/04/2017	0,2	0,4	NA	NA	NA	NA	NA
05/04/2017	1,0	1,6	NA	NA	NA	NA	NA
06/04/2017	0,6	1,1	NA	NA	NA	NA	NA
07/04/2017	1,0	1,5	NA	NA	NA	NA	NA
08/04/2017	0,9	1,3	NA	NA	NA	NA	NA
09/04/2017	0,9	1,2	NA	NA	NA	NA	NA
MEDIA	0,7	1,0	NA	NA	NA	NA	NA
MINIMO	0,0	0,0	NA	NA	NA	NA	NA
MASSIMO	1,0	1,6	NA	NA	NA	NA	NA

NOTE

NA: Non applicabile. Parametro non rilevato, in quanto non previsto nella stazione di misura

GRAFICO PM_{10} – MEDIA GIORNALIERA

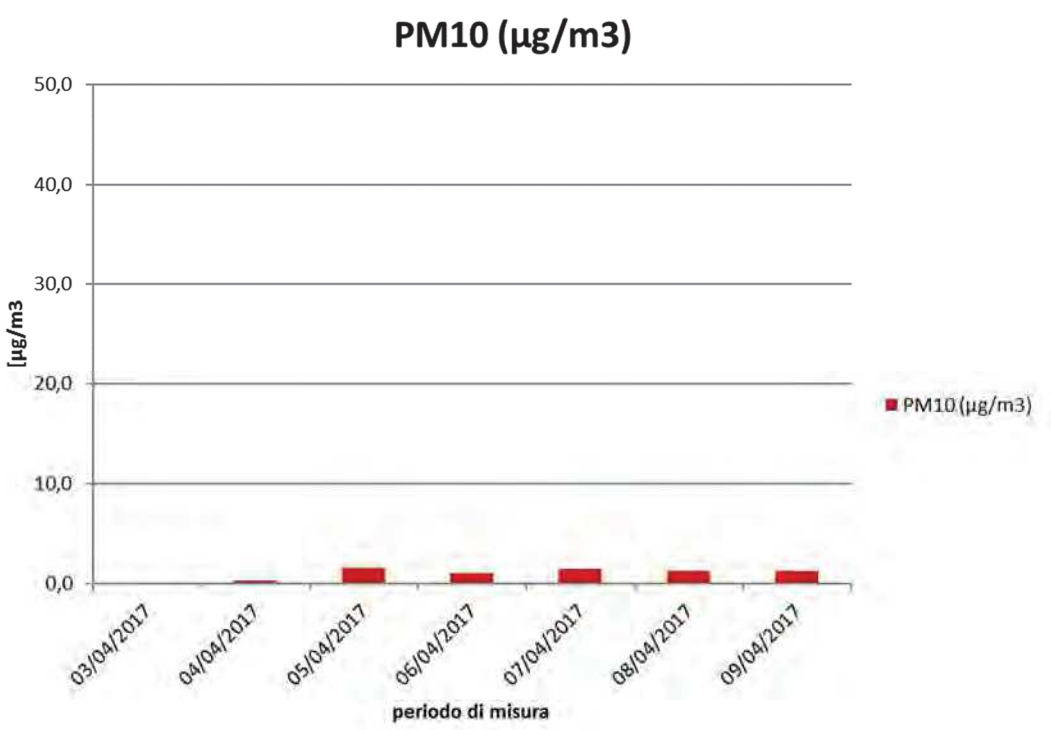
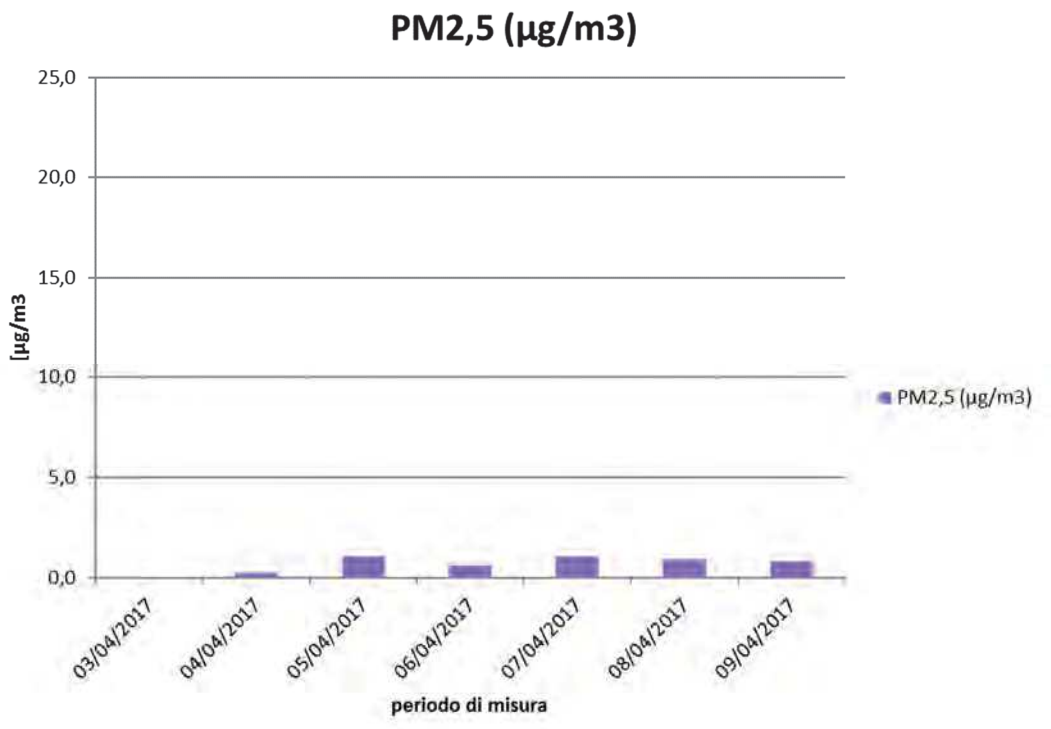


GRAFICO $PM_{2,5}$ – MEDIA GIORNALIERA



RST srl
Ricerca – Sviluppo - Tecnologia
C/da Capitano 42 87040 Castiglione Cosentino (CS)
Tel/fax 0984/442225 e-mail RSTSRL@libero.it

ATM_08 - DATI METEO - Riepilogo giornaliero – periodo di misura dal 03/04/2017 al 09/04/2017							
Data	**Temperatura (°C)**	**Direzione vento**	**Velocità vento (m/s)**	**Piovosità (mm)**	**Umidità (%)**	**Pressione atm. (hPa)**	**Radiazione solare (W/m²)**
03/04/2017	14,3	N	4,1	2,9	68	1019,7	28
04/04/2017	12,2	SE	4,5	1,7	53	1012,7	24
05/04/2017	15,3	SSW	2,9	0,0	51	1013,6	45
06/04/2017	13,2	NW	4,5	0,0	58	1015,9	41
07/04/2017	15,4	NE	3,2	0,0	46	1012,8	44
08/04/2017	12,3	SW	1,8	0,0	46	1018,3	51
09/04/2017	14,4	NE	2,8	0,0	44	1014,3	40

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ATM_08 - DATI LABORATORIO – Riepilogo giornaliero – periodo di misura dal 03/04/2017 al 09/04/2017			
Data	**PTS (µg/m3)**	**PM_{10} (µg/m^3)**	**$PM_{2,5}$ (µg/m^3)**
03/04/2017	0,0	0,0	0,0
04/04/2017	0,0	0,4	0,2
05/04/2017	2,1	1,1	1,6
06/04/2017	1,5	0,8	1,2
07/04/2017	2,1	1,0	1,5
08/04/2017	1,7	0,9	1,3
09/04/2017	1,6	0,8	1,2

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DOTTORE GIOVANNI MISASI N. 36083 SEZ. A

Il Direttore del laboratorio

SCHEDA PUNTO DI MISURA ATM 09

COORDINATE DI RIFERIMENTO: 16°17’23”E, 39°43’29”N

Fase di monitoraggio: Corso d’opera	Codice misura: ATM_09

LOCALIZZAZIONE GEOGRAFICA	
Località: Il Pantano Comune: Castrovillari Provincia: Cosenza Regione: Calabria Distanza dal tracciato: 10 m Pk: 4+570,00	Accesso al punto di misura: Il punto è ubicato all’interno dei un sito di deposito a servizio del cantiere Sorgenti esistenti: Attività agricole

PARAMETRI MISURATI				
PARAMETRO	METODO DI MISURA	COORDINATE		CODICI CAMPIONE
PM_{10}	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
$PM_{2,5}$	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
CO		X:Vedi sopra	Y: Vedi sopra	NA
NO		X:Vedi sopra	Y: Vedi sopra	NA
NO_2		X:Vedi sopra	Y: Vedi sopra	NA
C_6H_6		X:Vedi sopra	Y: Vedi sopra	NA
O_3		X:Vedi sopra	Y: Vedi sopra	NA
SO_2		X:Vedi sopra	Y: Vedi sopra	NA
Analisi metalli				
Parametri Meteo	DV – VV – RAD – UR – PIOGGIA – T - PRESS			

SORGENTI INQUINANTI NON CONNESSE CON L'INFRASTRUTTURA
Attività agricole

NOTE
Le lavorazioni in corso sono rappresentate da scavi, movimento terra e passaggio dei mezzi da cantiere

Operatore:	G. Pettinato

ANALISI CHIMICHE

DATA (gg/mm/aaaa)	$PM_{2,5}$ [µg/m^3]	PM_{10} [µg/m^3]	CO [µg/m^3]	NO [µg/m^3]	NO_2 [µg/m^3]	C_6H_6 [µg/m^3]	O_3 [µg/m^3]
10/04/2017	15,1	24,3	NA	NA	NA	NA	NA
11/04/2017	20,0	28,6	NA	NA	NA	NA	NA
12/04/2017	14,3	20,4	NA	NA	NA	NA	NA
13/04/2017	17,3	24,8	NA	NA	NA	NA	NA
14/04/2017	12,5	18,6	NA	NA	NA	NA	NA
15/04/2017	11,5	18,0	NA	NA	NA	NA	NA
16/04/2017	0,0	0,0	NA	NA	NA	NA	NA
MEDIA	13,0	19,2	NA	NA	NA	NA	NA
MINIMO	0,0	0,0	NA	NA	NA	NA	NA
MASSIMO	20,0	28,6	NA	NA	NA	NA	NA

NOTE

NA: Non applicabile. Parametro non rilevato, in quanto non previsto nella stazione di misura

GRAFICO PM_{10} – MEDIA GIORNALIERA

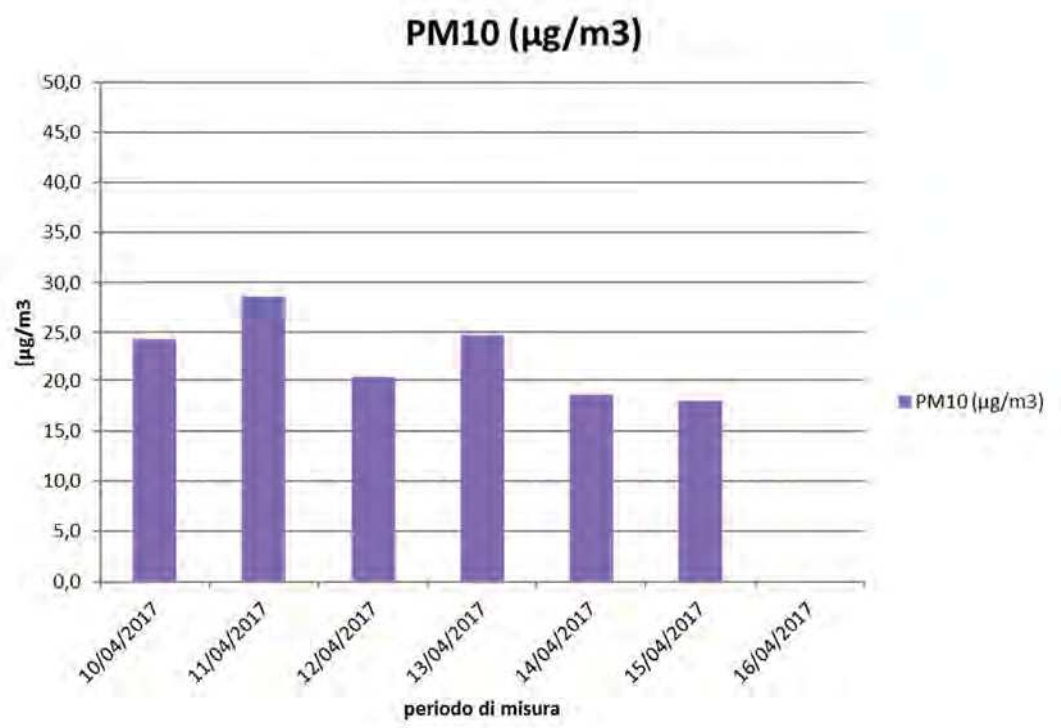
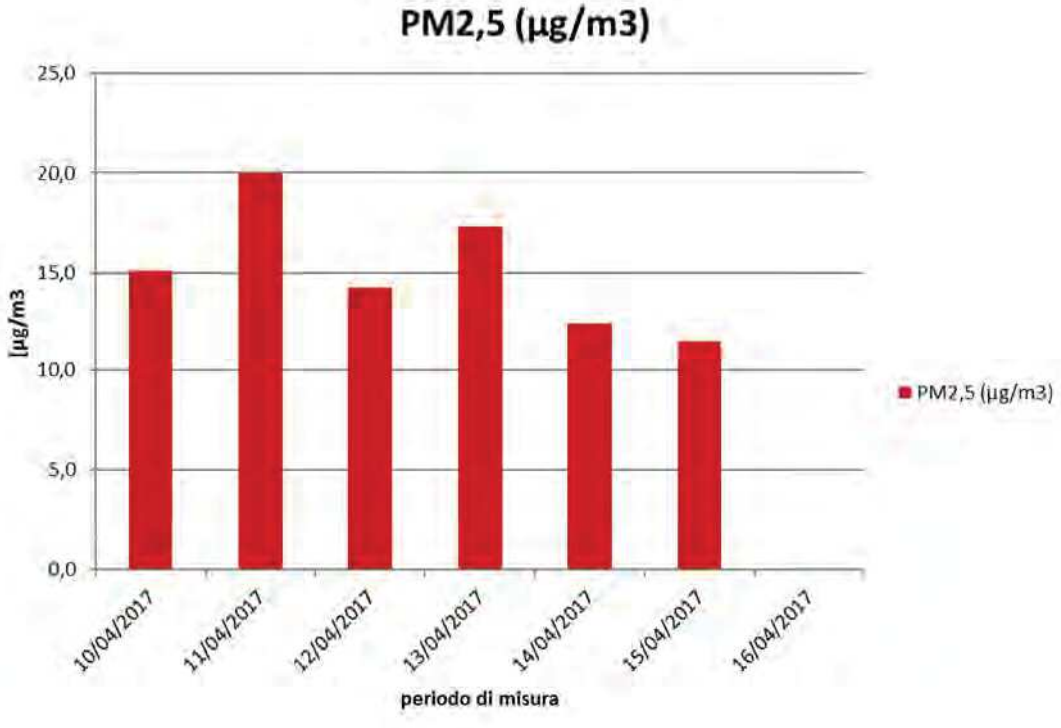


GRAFICO $PM_{2,5}$ – MEDIA GIORNALIERA



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ATM_09 - DATI METEO - Riepilogo giornaliero – periodo di misura dal 10/04/2017 al 16/04/2017							
Data	**Temperatura (°C)**	**Direzione vento**	**Velocità vento (m/s)**	**Piovosità (mm)**	**Umidità (%)**	**Pressione atm. (hPa)**	**Radiazione solare (W/m^2)**
10/04/2017	15,5	SE	1,5	0	63	1000,7	67
11/04/2017	16,2	S	1,8	0	63	1014,1	75
12/04/2017	15,7	NW	0,8	0	64	1013,3	66
13/04/2017	17,2	NE	1,5	0	70	1003,7	72
14/04/2017	17,8	SW	2,1	0	64	1014,1	70
15/04/2017	17,6	NW	0,4	0	70	1013,8	61
16/04/2017	14,5	S	0,7	2,1	71	1013,4	37

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ATM_09 - DATI LABORATORIO – Riepilogo giornaliero – periodo di misura dal 10/04/2017 al 16/04/2017			
Data	**PTS (µg/m3)**	**PM_{10} (µg/m^3)**	**$PM_{2,5}$ (µg/m^3)**
10/04/2017	30,4	24,3	15,1
11/04/2017	35,7	28,6	20,0
12/04/2017	29,1	20,4	14,3
13/04/2017	34,9	24,8	17,3
14/04/2017	24,8	18,6	12,5
15/04/2017	22,8	18,0	11,5
16/04/2017	0,00	0,00	0,00

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DOTTORE GIOVANNI MISASI N. 36083 SEZ. A

Il Direttore del laboratorio

SCHEDA PUNTO DI MISURA ATM 10

COORDINATE DI RIFERIMENTO: 16°19'40"E, 39°43'37"N

Fase di monitoraggio: Corso d'opera	Codice misura: ATM_10

LOCALIZZAZIONE GEOGRAFICA	
Località: Cambianello Comune: Cassano allo Jonio Provincia: Cosenza Regione: Calabria Distanza dal tracciato: 34 m Pk: 7+600,00	Accesso al punto di misura: Il punto è ubicato all'interno di un sito di deposito a servizio del cantiere Sorgenti esistenti: attività agricole

PARAMETRI MISURATI				
PARAMETRO	METODO DI MISURA	COORDINATE		CODICI CAMPIONE
PM_{10}	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
$PM_{2,5}$	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
CO		X:Vedi sopra	Y: Vedi sopra	NA
NO		X:Vedi sopra	Y: Vedi sopra	NA
NO_2		X:Vedi sopra	Y: Vedi sopra	NA
C_6H_6		X:Vedi sopra	Y: Vedi sopra	NA
O_3		X:Vedi sopra	Y: Vedi sopra	NA
SO_2		X:Vedi sopra	Y: Vedi sopra	NA
Analisi metalli				
Parametri Meteo	DV – VV – RAD – UR – PIOGGIA – T - PRESS			

SORGENTI INQUINANTI NON CONNESSE CON L'INFRASTRUTTURA
Attività agricole

NOTE
Le lavorazioni in corso sono rappresentate da scavi e movimento terra

Operatore:	G. Pettinato

ANALISI CHIMICHE

DATA (gg/mm/aaaa)	$PM_{2,5}$ [µg/m^3]	PM_{10} [µg/m^3]	CO [µg/m^3]	NO [µg/m^3]	NO_2 [µg/m^3]	C_6H_6 [µg/m^3]	O_3 [µg/m^3]
26/04/2017	18,4	26,6	NA	NA	NA	NA	NA
27/04/2017	15,5	22,2	NA	NA	NA	NA	NA
28/04/2017	14,6	20,9	NA	NA	NA	NA	NA
29/04/2017	11,9	19,8	NA	NA	NA	NA	NA
30/04/2017	1,9	3,0	NA	NA	NA	NA	NA
01/05/2017	2,7	4,1	NA	NA	NA	NA	NA
02/05/2017	3,2	4,7	NA	NA	NA	NA	NA
MEDIA	9,7	14,5	NA	NA	NA	NA	NA
MINIMO	1,9	3,0	NA	NA	NA	NA	NA
MASSIMO	18,4	26,6	NA	NA	NA	NA	NA

NOTE

NA: Non applicabile. Parametro non rilevato, in quanto non previsto nella stazione di misura

GRAFICO PM_{10} – MEDIA GIORNALIERA

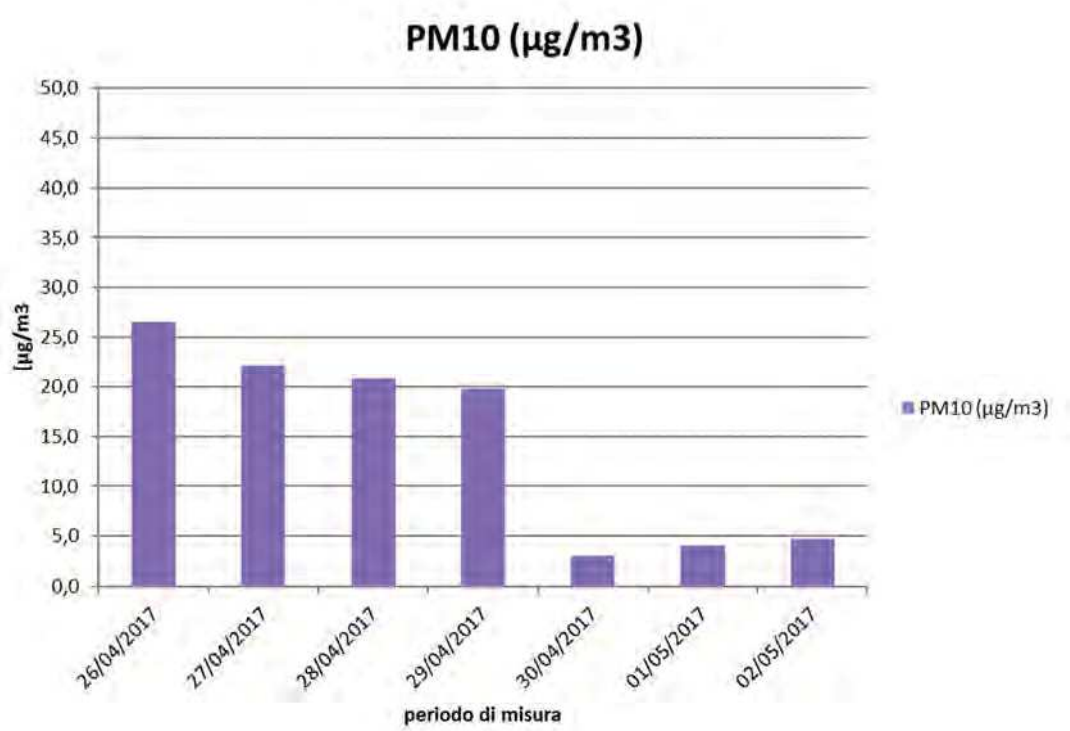
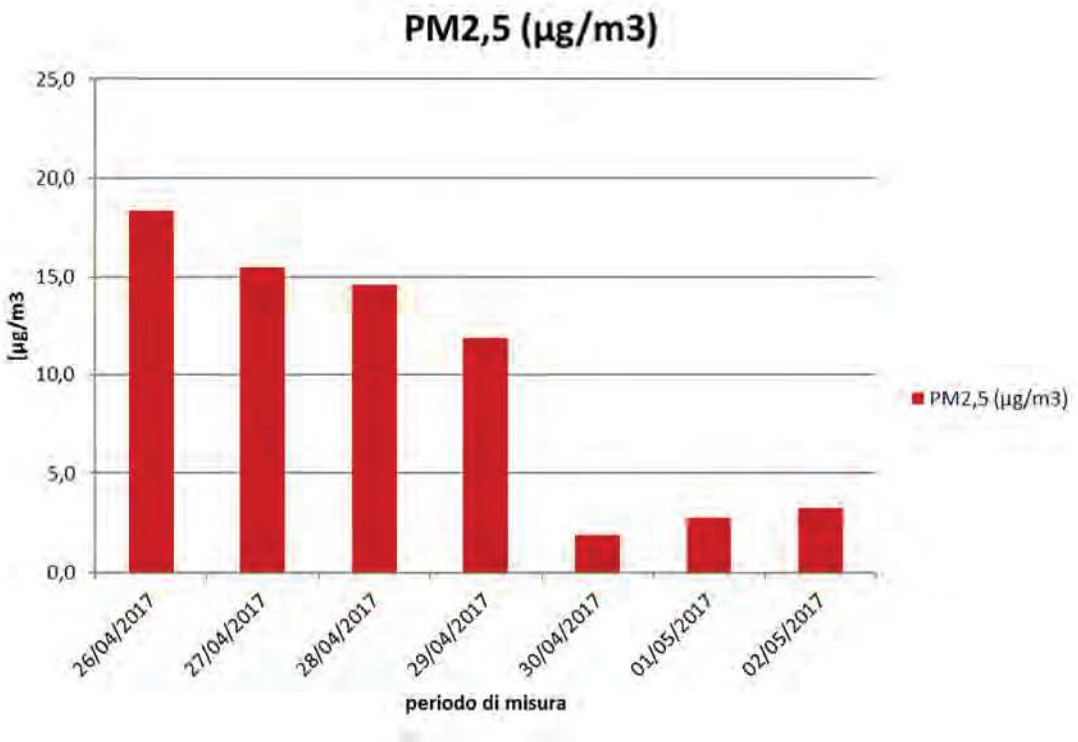


GRAFICO $PM_{2,5}$ – MEDIA GIORNALIERA



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ATM_10 - DATI METEO - Riepilogo giornaliero – periodo di misura dal 26/04/2017 al 02/05/2017							
Data	**Temperatura (°C)**	**Direzione vento**	**Velocità vento (m/s)**	**Piovosità (mm)**	**Umidità (%)**	**Pressione atm. (hPa)**	**Radiazione solare (W/m^2)**
26/04/2017	16,4	E	0,1	0,0	63	1030,1	154
27/04/2017	20,5	NW	0,3	0,0	62	1027,1	153
28/04/2017	17,9	S	0,2	0,0	70	1020,2	176
29/04/2017	17,1	SW	0,5	0,0	61	1022,5	178
30/04/2017	20,8	SW	0,3	0,0	60	1023,7	176
01/05/2017	16,2	NE	0,9	0,0	61	1025,7	185
02/05/2017	16,3	NNW	0,4	0,0	61	1027,5	193

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ATM_10 - DATI LABORATORIO – Riepilogo giornaliero – periodo di misura dal 26/04/2017 al 02/05/2017			
Data	**PTS (µg/m3)**	**PM_{10} (µg/m^3)**	**$PM_{2,5}$ (µg/m^3)**
26/04/2017	35	26,6	18,4
27/04/2017	31,2	22,2	15,5
28/04/2017	29,8	20,9	14,6
29/04/2017	26,4	19,8	11,9
30/04/2017	4,1	3,0	1,9
01/05/2017	5,4	4,1	2,7
02/05/2017	6	4,7	3,2

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DOTTORE GIOVANNI MISASI N. 36083 SEZ. A

Il Direttore del laboratorio

SCHEDA PUNTO DI MISURA ATM 11

COORDINATE DI RIFERIMENTO: 16°21'59"E, 39°43'26"N

Fase di monitoraggio: Corso d'opera	Codice misura: ATM_11

LOCALIZZAZIONE GEOGRAFICA	
Località: Fraz. Doria Comune: Cassano allo Jonio Provincia: Cosenza Regione: Calabria Distanza dal tracciato: 70 m Pk: 11+120,00	Accesso al punto di misura: Il punto è ubicato nei pressi di un edificio residenziale prossino al cantiere Sorgenti esistenti: Traffico veicolare, attività agricola

PARAMETRI MISURATI				
PARAMETRO	METODO DI MISURA	COORDINATE		CODICI CAMPIONE
PM_{10}	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
$PM_{2,5}$	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
CO		X:Vedi sopra	Y: Vedi sopra	NA
NO		X:Vedi sopra	Y: Vedi sopra	NA
NO_2		X:Vedi sopra	Y: Vedi sopra	NA
C_6H_6		X:Vedi sopra	Y: Vedi sopra	NA
O_3		X:Vedi sopra	Y: Vedi sopra	NA
SO_2		X:Vedi sopra	Y: Vedi sopra	NA
Analisi metalli				
Parametri Meteo	DV – VV – RAD – UR – PIOGGIA – T - PRESS			

SORGENTI INQUINANTI NON CONNESSE CON L'INFRASTRUTTURA
Traffico veicolare, attività agricola

NOTE
Le lavorazioni in corso sono rappresentate da scavi, movimento terra e getti di calcestruzzo

Operatore:	G. Pettinato

ANALISI CHIMICHE

DATA (gg/mm/aaaa)	$PM_{2,5}$ [µg/m^3]	PM_{10} [µg/m^3]	CO [µg/m^3]	NO [µg/m^3]	NO_2 [µg/m^3]	C_6H_6 [µg/m^3]	O_3 [µg/m^3]
19/04/2017	0,0	0,0	NA	NA	NA	NA	NA
20/04/2017	0,0	0,0	NA	NA	NA	NA	NA
21/04/2017	5,4	7,7	NA	NA	NA	NA	NA
22/04/2017	7,7	12,2	NA	NA	NA	NA	NA
23/04/2017	2,5	3,8	NA	NA	NA	NA	NA
24/04/2017	2,5	4,0	NA	NA	NA	NA	NA
25/04/2017	2,0	3,3	NA	NA	NA	NA	NA
MEDIA	2,9	4,4	NA	NA	NA	NA	NA
MINIMO	0,0	0,0	NA	NA	NA	NA	NA
MASSIMO	7,7	12,2	NA	NA	NA	NA	NA

NOTE

NA: Non applicabile. Parametro non rilevato, in quanto non previsto nella stazione di misura

GRAFICO PM_{10} – MEDIA GIORNALIERA

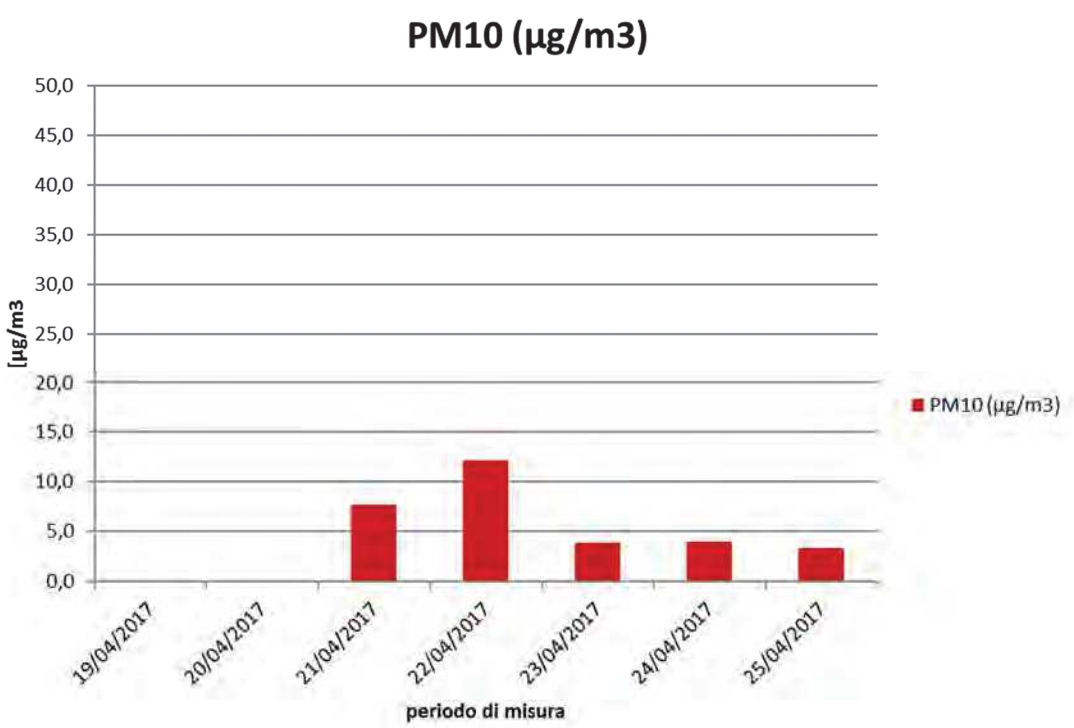
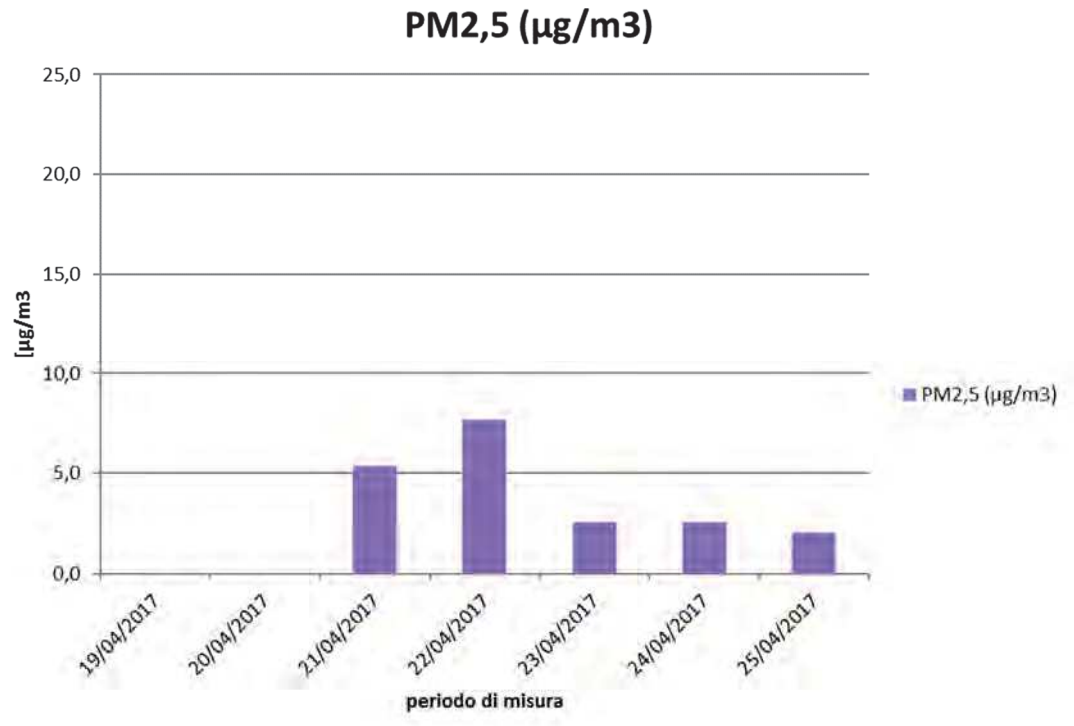


GRAFICO $PM_{2,5}$ – MEDIA GIORNALIERA



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ATM_11 - DATI METEO - Riepilogo giornaliero – periodo di misura dal 19/04/2017 al 25/04/2017							
Data	**Temperatura (°C)**	**Direzione vento**	**Velocità vento (m/s)**	**Piovosità (mm)**	**Umidità (%)**	**Pressione atm. (hPa)**	**Radiazione solare (W/m^2)**
19/04/2017	8,8	WSW	0,4	2,5	60	1019,8	150
20/04/2017	14,9	SE	0,2	4,2	60	1020,8	143
21/04/2017	10,1	SSW	0,4	0,0	45	1018,3	124
22/04/2017	11,6	N	0,6	0,0	41	1020,1	113
23/04/2017	14,9	NNE	0,6	0,0	47	1019,2	121
24/04/2017	15,9	SSE	0,7	0,0	59	1018,8	123
25/04/2017	13,8	E	0,7	0,0	60	1018,1	150

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ATM_11 - DATI LABORATORIO – Riepilogo giornaliero – periodo di misura dal 19/04/2017 al 25/04/2017			
Data	**PTS (µg/m3)**	**PM_{10} (µg/m^3)**	**$PM_{2,5}$ (µg/m^3)**
19/04/2017	0,0	0,0	0,0
20/04/2017	0,0	0,0	0,0
21/04/2017	10,1	7,7	5,4
22/04/2017	15,8	12,2	7,7
23/04/2017	4,8	3,8	2,5
24/04/2017	5,5	4,0	2,5
25/04/2017	4,5	3,3	2,0

ORDINE NAZIONALE DEI BIOLOGI ALBO PROFESSIONALE
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Il Direttore del laboratorio

RILIEVI DI MAGGIO 2017

SCHEDA PUNTO DI MISURA ATM 08

COORDINATE DI RIFERIMENTO: 16°15'06"E, 39°43'24"N

Fase di monitoraggio: Corso d'opera	Codice misura: ATM_08

LOCALIZZAZIONE GEOGRAFICA	
Località: Cammarata Comune: Castrovillari Provincia: Cosenza	Accesso al punto di misura: Il punto è ubicato all'interno dei un sito di deposito a servizio del cantiere
Regione: Calabria Distanza dal tracciato: 5 m Pk: 1+040,00	Sorgenti esistenti: Attività agricole

PARAMETRI MISURATI				
PARAMETRO	METODO DI MISURA	COORDINATE		CODICI CAMPIONE
PM_{10}	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
$PM_{2,5}$	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
CO		X:Vedi sopra	Y: Vedi sopra	NA
NO		X:Vedi sopra	Y: Vedi sopra	NA
NO_2		X:Vedi sopra	Y: Vedi sopra	NA
C_6H_6		X:Vedi sopra	Y: Vedi sopra	NA
O_3		X:Vedi sopra	Y: Vedi sopra	NA
SO_2		X:Vedi sopra	Y: Vedi sopra	NA
Analisi metalli				
Parametri Meteo	DV – VV – RAD – UR – PIOGGIA – T - PRESS			

SORGENTI INQUINANTI NON CONNESSE CON L'INFRASTRUTTURA
Attività agricole

NOTE
Le lavorazioni in corso sono rappresentate da movimento terra

Operatore:	G. Pettinato

ANALISI CHIMICHE

DATA (gg/mm/aaaa)	$PM_{2,5}$ [µg/m^3]	PM_{10} [µg/m^3]	CO [µg/m^3]	NO [µg/m^3]	NO_2 [µg/m^3]	C_6H_6 [µg/m^3]	O_3 [µg/m^3]
03/05/2017	1,5	2,3	NA	NA	NA	NA	NA
04/05/2017	1,1	1,8	NA	NA	NA	NA	NA
05/05/2017	2,3	3,5	NA	NA	NA	NA	NA
06/05/2017	0,9	1,3	NA	NA	NA	NA	NA
07/05/2017	0,9	1,5	NA	NA	NA	NA	NA
08/05/2017	1,4	2,0	NA	NA	NA	NA	NA
09/05/2017	1,1	1,8	NA	NA	NA	NA	NA
MEDIA	1,3	2,0	NA	NA	NA	NA	NA
MINIMO	0,9	1,3	NA	NA	NA	NA	NA
MASSIMO	2,3	3,5	NA	NA	NA	NA	NA

NOTE

NA: Non applicabile. Parametro non rilevato, in quanto non previsto nella stazione di misura

GRAFICO PM_{10} – MEDIA GIORNALIERA

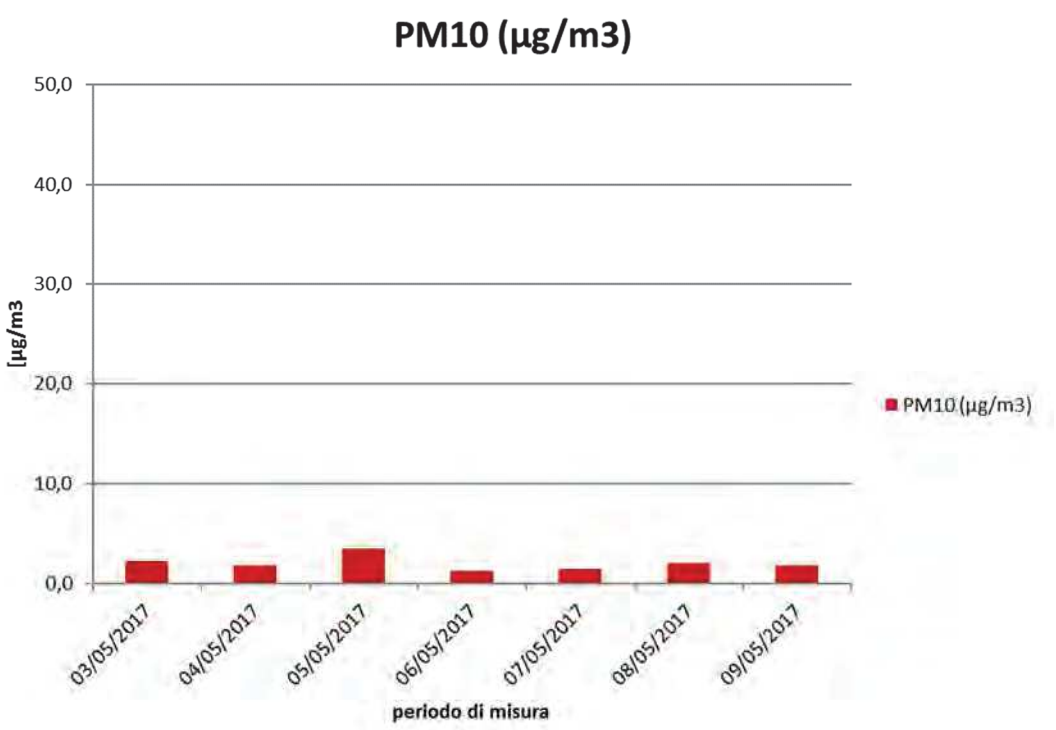
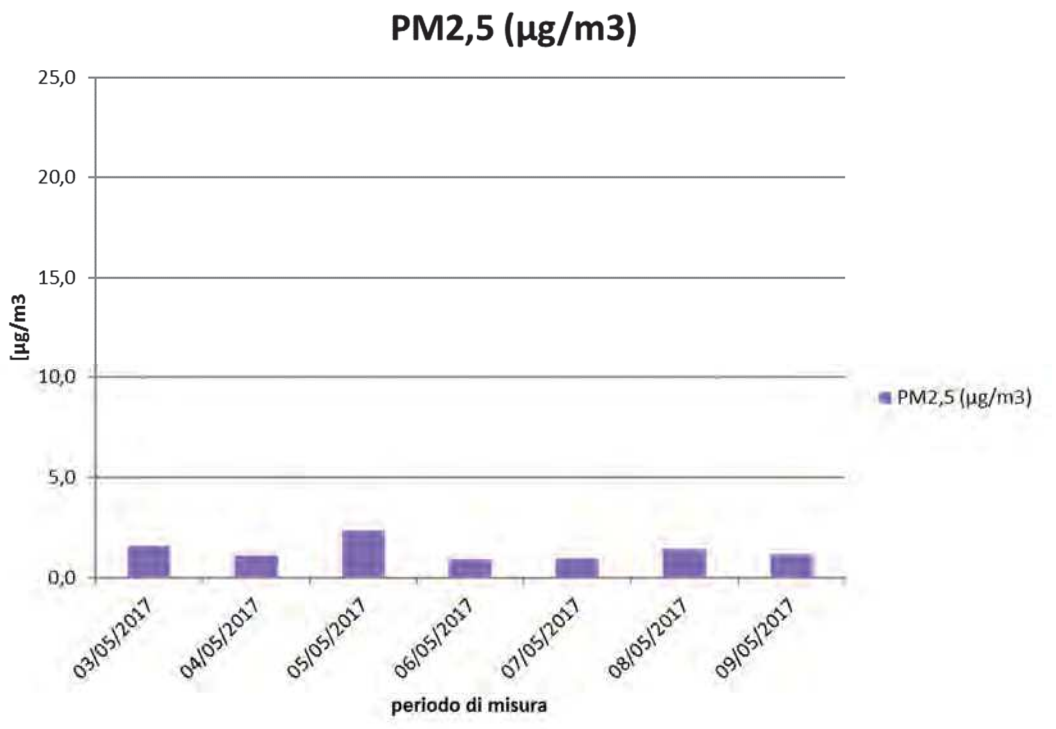


GRAFICO $PM_{2,5}$ – MEDIA GIORNALIERA



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ATM_08 - DATI METEO - Riepilogo giornaliero – periodo di misura dal 03/05/2017 al 09/05/2017							
Data	**Temperatura (°C)**	**Direzione vento**	**Velocità vento (m/s)**	**Piovosità (mm)**	**Umidità (%)**	**Pressione atm. (hPa)**	**Radiazione solare (W/m²)**
03/05/2017	19,3	NE	1,8	0	45	1019,7	175
04/05/2017	19,5	WSW	1,3	0	44	1025,6	192
05/05/2017	23,1	SW	3,6	0	43	1023,3	250
06/05/2017	24,7	W	4,5	0	47	1015,9	231
07/05/2017	22,4	SW	4,5	0	50	1013,4	221
08/05/2017	20,5	SW	1,3	0	47	1013,6	240
09/05/2017	19,5	NW	1,1	0	52	1008,9	215

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ATM_08 - DATI LABORATORIO – Riepilogo giornaliero – periodo di misura dal 03/05/2017 al 09/05/2017			
Data	**PTS (µg/m3)**	**PM_{10} (µg/m³)**	**$PM_{2,5}$ (µg/m³)**
03/05/2017	3,1	1,5	2,3
04/05/2017	2,4	1,1	1,8
05/05/2017	4,5	2,3	3,5
06/05/2017	1,8	0,9	1,3
07/05/2017	2	0,9	1,5
08/05/2017	2,8	1,4	2,0
09/05/2017	2,5	1,1	1,8

ORDINE NAZIONALE DEI BIOLOGI ALBO PROFESSIONALE
DOTTORE GIOVANNI MISASI N. 36083 SEZ. A

Il Direttore del laboratorio

SCHEDA PUNTO DI MISURA ATM 09

COORDINATE DI RIFERIMENTO: 16°17’23”E, 39°43’29”N

Fase di monitoraggio: Corso d’opera	Codice misura: ATM_09

LOCALIZZAZIONE GEOGRAFICA	
Località: Il Pantano Comune: Castrovillari Provincia: Cosenza Regione: Calabria Distanza dal tracciato: 10 m Pk: 4+570,00	Accesso al punto di misura: Il punto è ubicato all’interno dei un sito di deposito a servizio del cantiere Sorgenti esistenti: Attività agricole

PARAMETRI MISURATI				
PARAMETRO	METODO DI MISURA	COORDINATE		CODICI CAMPIONE
PM_{10}	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
$PM_{2,5}$	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
CO		X:Vedi sopra	Y: Vedi sopra	NA
NO		X:Vedi sopra	Y: Vedi sopra	NA
NO_2		X:Vedi sopra	Y: Vedi sopra	NA
C_6H_6		X:Vedi sopra	Y: Vedi sopra	NA
O_3		X:Vedi sopra	Y: Vedi sopra	NA
SO_2		X:Vedi sopra	Y: Vedi sopra	NA
Analisi metalli				
Parametri Meteo	DV – VV – RAD – UR – PIOGGIA – T - PRESS			

SORGENTI INQUINANTI NON CONNESSE CON L'INFRASTRUTTURA
Attività agricole

NOTE
Le lavorazioni in corso sono rappresentate da scavi, movimento terra e passaggio dei mezzi da cantiere

Operatore:	G. Pettinato

ANALISI CHIMICHE

DATA (gg/mm/aaaa)	$PM_{2,5}$ [µg/m^3]	PM_{10} [µg/m^3]	CO [µg/m^3]	NO [µg/m^3]	NO_2 [µg/m^3]	C_6H_6 [µg/m^3]	O_3 [µg/m^3]
10/05/2017	20,1	10,3	NA	NA	NA	NA	NA
11/05/2017	19,4	10,1	NA	NA	NA	NA	NA
12/05/2017	25,5	13,4	NA	NA	NA	NA	NA
13/05/2017	10,5	5,9	NA	NA	NA	NA	NA
14/05/2017	5,8	2,6	NA	NA	NA	NA	NA
15/05/2017	18,4	9,0	NA	NA	NA	NA	NA
16/05/2017	24,8	11,8	NA	NA	NA	NA	NA
MEDIA	9,0	13,7	NA	NA	NA	NA	NA
MINIMO	2,6	4,1	NA	NA	NA	NA	NA
MASSIMO	13,4	19,3	NA	NA	NA	NA	NA

NOTE

NA: Non applicabile. Parametro non rilevato, in quanto non previsto nella stazione di misura

GRAFICO PM_{10} – MEDIA GIORNALIERA

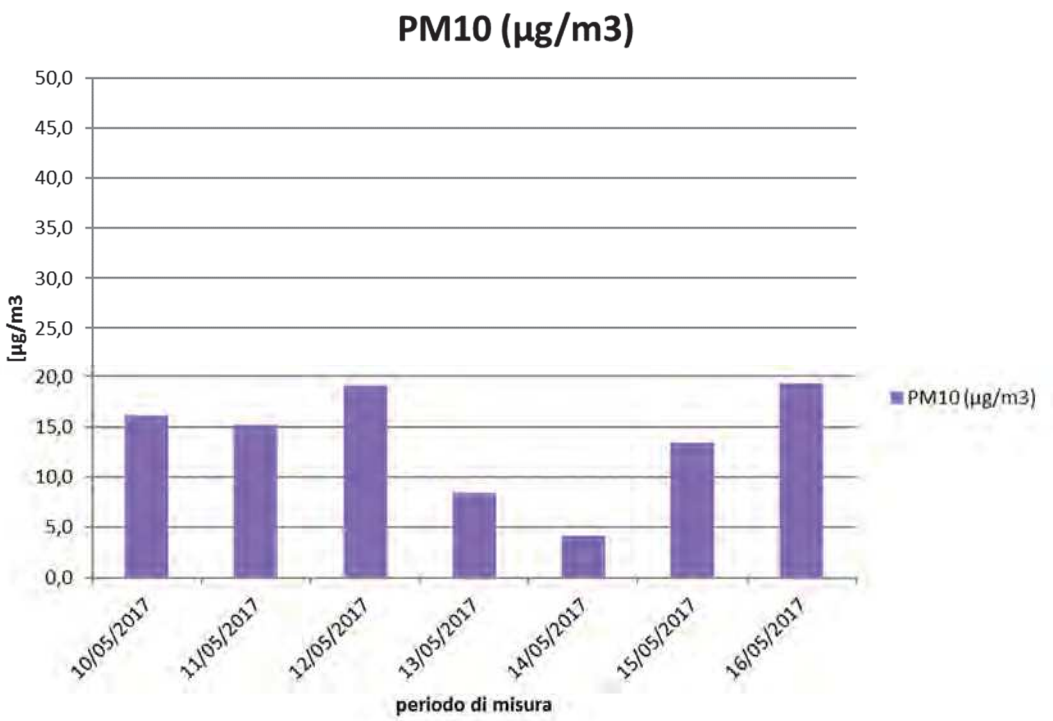
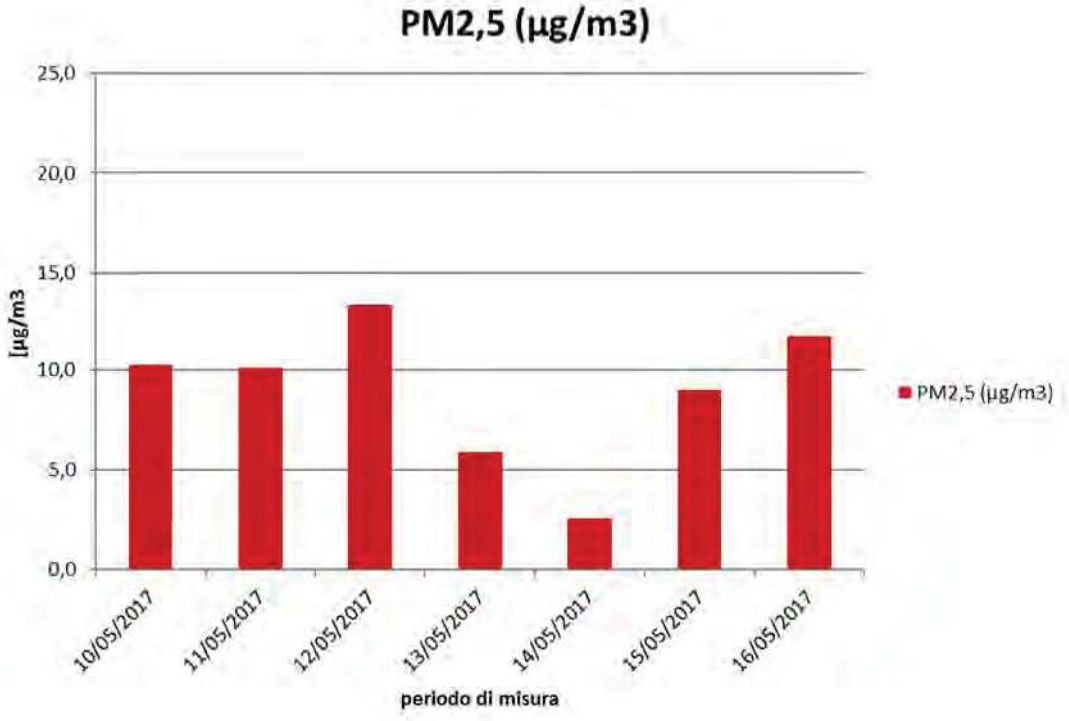


GRAFICO $PM_{2,5}$ – MEDIA GIORNALIERA



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ATM_09 - DATI METEO - Riepilogo giornaliero – periodo di misura dal 10/05/2017 al 16/05/2017							
Data	**Temperatura (°C)**	**Direzione vento**	**Velocità vento (m/s)**	**Piovosità (mm)**	**Umidità (%)**	**Pressione atm. (hPa)**	**Radiazione solare (W/m²)**
10/05/2017	22,8	E	0,9	0,0	33	1015,3	189
11/05/2017	23	ENE	1,3	0,0	39	1018,3	200
12/05/2017	25,4	NE	0,9	0,0	47	1020,1	186
13/05/2017	22,4	WSW	0,9	0,0	42	1018,7	182
14/05/2017	20,9	WSW	0,9	0,0	32	1015,6	183
15/05/2017	24,8	WNW	1,3	0,0	48	1019,9	190
16/05/2017	23,5	E	3,6	0,0	45	1020,4	203

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ATM_09 - DATI LABORATORIO – Riepilogo giornaliero – periodo di misura dal 10/05/2017 al 16/05/2017			
Data	**PTS (µg/m3)**	**PM_{10} (µg/m^3)**	**$PM_{2,5}$ (µg/m^3)**
10/05/2017	20,1	16,1	10,3
11/05/2017	19,4	15,1	10,1
12/05/2017	25,5	19,1	13,4
13/05/2017	10,5	8,4	5,9
14/05/2017	5,8	4,1	2,6
15/05/2017	18,4	13,4	9,0
16/05/2017	24,8	19,3	11,8

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Il Direttore del laboratorio

SCHEDA PUNTO DI MISURA ATM 10

COORDINATE DI RIFERIMENTO: 16°19'40"E, 39°43'37"N

Fase di monitoraggio: Corso d'opera	Codice misura: ATM_10

LOCALIZZAZIONE GEOGRAFICA	
Località: Cambianello Comune: Cassano allo Jonio Provincia: Cosenza Regione: Calabria Distanza dal tracciato: 34 m Pk: 7+600,00	Accesso al punto di misura: Il punto è ubicato all'interno di un sito di deposito a servizio del cantiere Sorgenti esistenti: attività agricole

PARAMETRI MISURATI				
PARAMETRO	METODO DI MISURA	COORDINATE		CODICI CAMPIONE
PM_{10}	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
$PM_{2,5}$	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
CO		X:Vedi sopra	Y: Vedi sopra	NA
NO		X:Vedi sopra	Y: Vedi sopra	NA
NO_2		X:Vedi sopra	Y: Vedi sopra	NA
C_6H_6		X:Vedi sopra	Y: Vedi sopra	NA
O_3		X:Vedi sopra	Y: Vedi sopra	NA
SO_2		X:Vedi sopra	Y: Vedi sopra	NA
Analisi metalli				
Parametri Meteo	DV – VV – RAD – UR – PIOGGIA – T - PRESS			

SORGENTI INQUINANTI NON CONNESSE CON L'INFRASTRUTTURA
Attività agricole

NOTE
Le lavorazioni in corso sono rappresentate da scavi e movimento terra

Operatore:	G. Pettinato

ANALISI CHIMICHE

DATA (gg/mm/aaaa)	$PM_{2,5}$ [µg/m^3]	PM_{10} [µg/m^3]	CO [µg/m^3]	NO [µg/m^3]	NO_2 [µg/m^3]	C_6H_6 [µg/m^3]	O_3 [µg/m^3]
17/05/2017	4,9	7,9	NA	NA	NA	NA	NA
18/05/2017	2,6	3,9	NA	NA	NA	NA	NA
19/05/2017	4,8	7,8	NA	NA	NA	NA	NA
20/05/2017	4,1	6,8	NA	NA	NA	NA	NA
21/05/2017	0,0	0,0	NA	NA	NA	NA	NA
22/05/2017	3,1	5,2	NA	NA	NA	NA	NA
23/05/2017	3,9	6,0	NA	NA	NA	NA	NA
MEDIA	3,3	5,4	NA	NA	NA	NA	NA
MINIMO	0,0	0,0	NA	NA	NA	NA	NA
MASSIMO	4,9	7,9	NA	NA	NA	NA	NA

NOTE

NA: Non applicabile. Parametro non rilevato, in quanto non previsto nella stazione di misura

GRAFICO PM_{10} – MEDIA GIORNALIERA

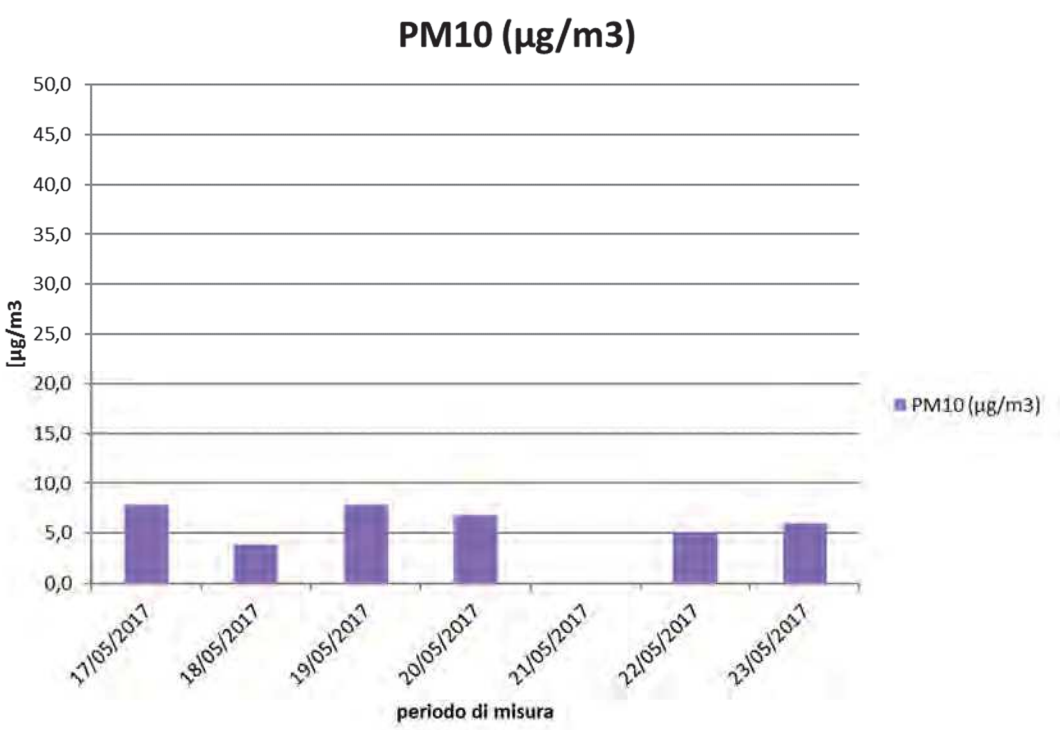
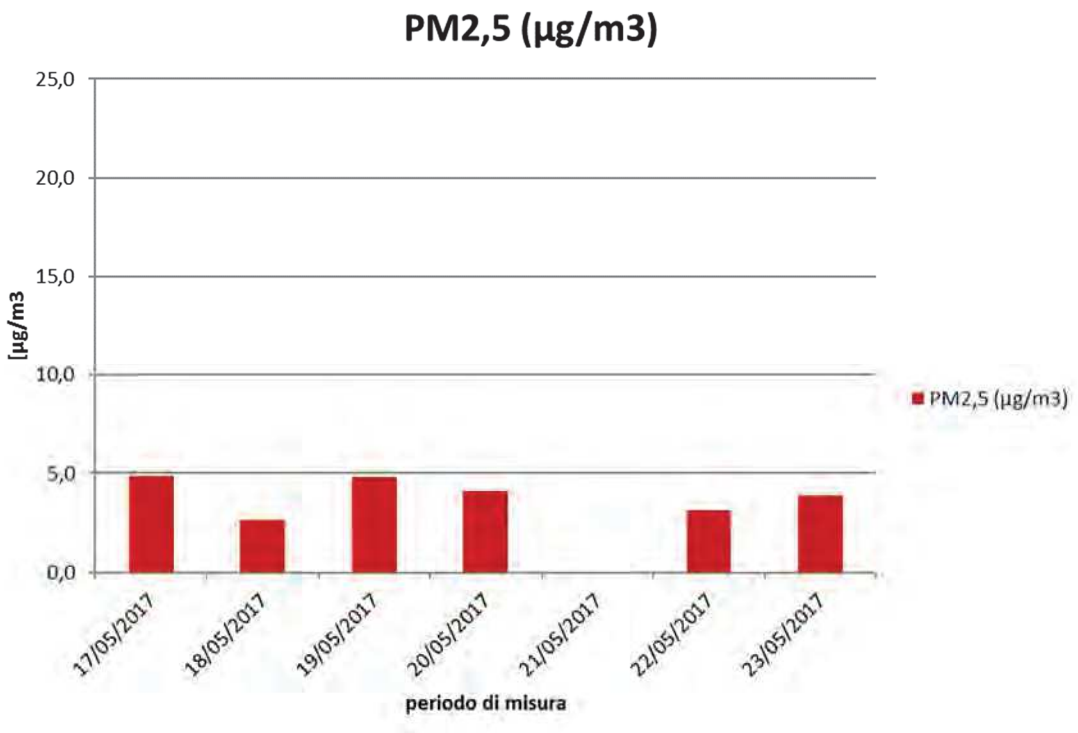


GRAFICO $PM_{2,5}$ – MEDIA GIORNALIERA



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ATM_10 - DATI METEO - Riepilogo giornaliero – periodo di misura dal 17/05/2017 al 23/05/2017							
Data	**Temperatura (°C)**	**Direzione vento**	**Velocità vento (m/s)**	**Piovosità (mm)**	**Umidità (%)**	**Pressione atm. (hPa)**	**Radiazione solare (W/m²)**
17/05/2017	19,6	WNW	1,8	0,2	68	1031,7	176
18/05/2017	21,4	WNW	1,3	0,0	70	1027,7	371
19/05/2017	19,5	SW	0,9	0,0	64	1020,3	308
20/05/2017	20,4	NE	1,8	0,0	66	1027,7	348
21/05/2017	18,6	E	3,6	1,5	67	1029,2	111
22/05/2017	20,6	S	0,9	0,0	63	1022,7	316
23/05/2017	20,4	NNE	1,3	0,4	65	1024,6	115

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ATM_10 - DATI LABORATORIO – Riepilogo giornaliero – periodo di misura dal 17/05/2017 al 23/05/2017			
Data	**PTS (µg/m3)**	**PM_{10} (µg/m^3)**	**$PM_{2,5}$ (µg/m^3)**
17/05/2017	10,2	7,9	4,9
18/05/2017	5,4	3,9	2,6
19/05/2017	11,2	7,8	4,8
20/05/2017	9,6	6,8	4,1
21/05/2017	0	0,0	0,0
22/05/2017	7,4	5,2	3,1
23/05/2017	8	6,0	3,9

Il Direttore del laboratorio

SCHEDA PUNTO DI MISURA ATM 11

COORDINATE DI RIFERIMENTO: 16°21'59"E, 39°43'26"N

Fase di monitoraggio: Corso d'opera	Codice misura: ATM_11

LOCALIZZAZIONE GEOGRAFICA	
Località: Fraz. Doria Comune: Cassano allo Jonio Provincia: Cosenza Regione: Calabria Distanza dal tracciato: 70 m Pk: 11+120,00	Accesso al punto di misura: Il punto è ubicato nei pressi di un edificio residenziale prossino al cantiere Sorgenti esistenti: Traffico veicolare, attività agricola

PARAMETRI MISURATI				
PARAMETRO	METODO DI MISURA	COORDINATE		CODICI CAMPIONE
PM_{10}	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
$PM_{2,5}$	Campionamento sequenziale	X:Vedi sopra	Y: Vedi sopra	NA
CO		X:Vedi sopra	Y: Vedi sopra	NA
NO		X:Vedi sopra	Y: Vedi sopra	NA
NO_2		X:Vedi sopra	Y: Vedi sopra	NA
C_6H_6		X:Vedi sopra	Y: Vedi sopra	NA
O_3		X:Vedi sopra	Y: Vedi sopra	NA
SO_2		X:Vedi sopra	Y: Vedi sopra	NA
Analisi metalli				
Parametri Meteo	DV – VV – RAD – UR – PIOGGIA – T - PRESS			

SORGENTI INQUINANTI NON CONNESSE CON L'INFRASTRUTTURA
Traffico veicolare, attività agricola

NOTE
Le lavorazioni in corso sono rappresentate da scavi, movimento terra, getti di calcestruzzo, posa in opera dell'idraulica di piattaforma

Operatore:	G. Pettinato

ANALISI CHIMICHE

DATA (gg/mm/aaaa)	$PM_{2,5}$ [µg/m^3]	PM_{10} [µg/m^3]	CO [µg/m^3]	NO [µg/m^3]	NO_2 [µg/m^3]	C_6H_6 [µg/m^3]	O_3 [µg/m^3]
24/05/2017	8,4	11,9	NA	NA	NA	NA	NA
25/05/2017	9,5	14,7	NA	NA	NA	NA	NA
26/05/2017	6,4	9,4	NA	NA	NA	NA	NA
27/05/2017	5,3	7,8	NA	NA	NA	NA	NA
28/05/2017	2,8	4,2	NA	NA	NA	NA	NA
29/05/2017	10,4	15,7	NA	NA	NA	NA	NA
30/05/2017	11,3	17,9	NA	NA	NA	NA	NA
MEDIA	7,7	11,6	NA	NA	NA	NA	NA
MINIMO	2,8	4,2	NA	NA	NA	NA	NA
MASSIMO	11,3	17,9	NA	NA	NA	NA	NA

NOTE

NA: Non applicabile. Parametro non rilevato, in quanto non previsto nella stazione di misura

GRAFICO PM_{10} – MEDIA GIORNALIERA

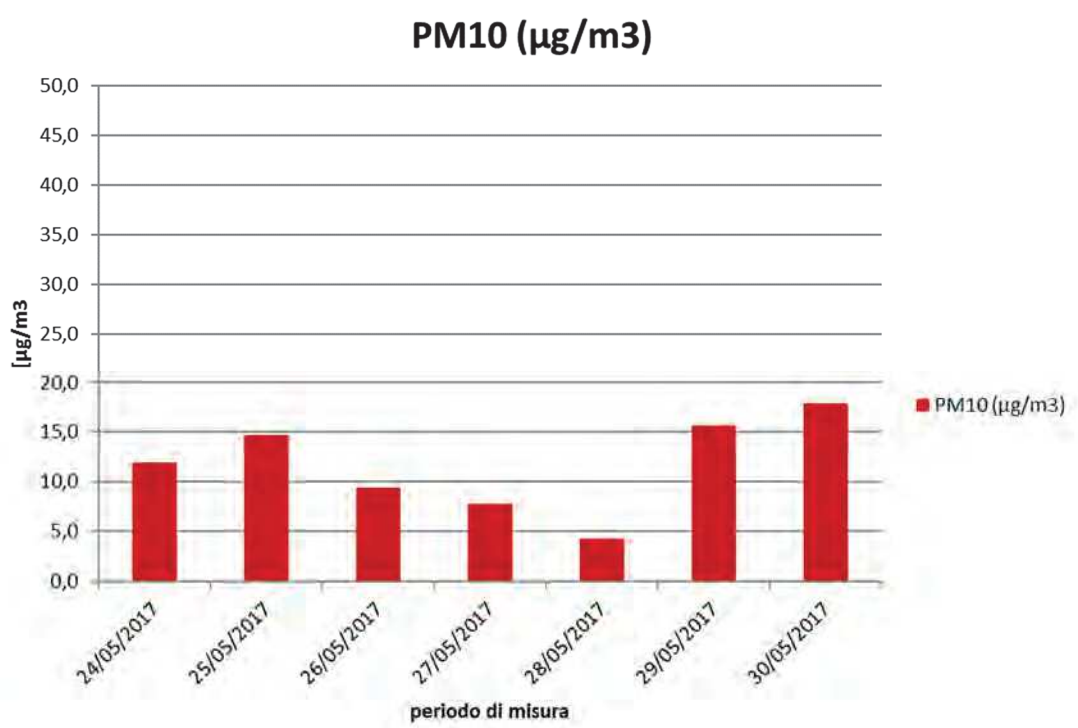
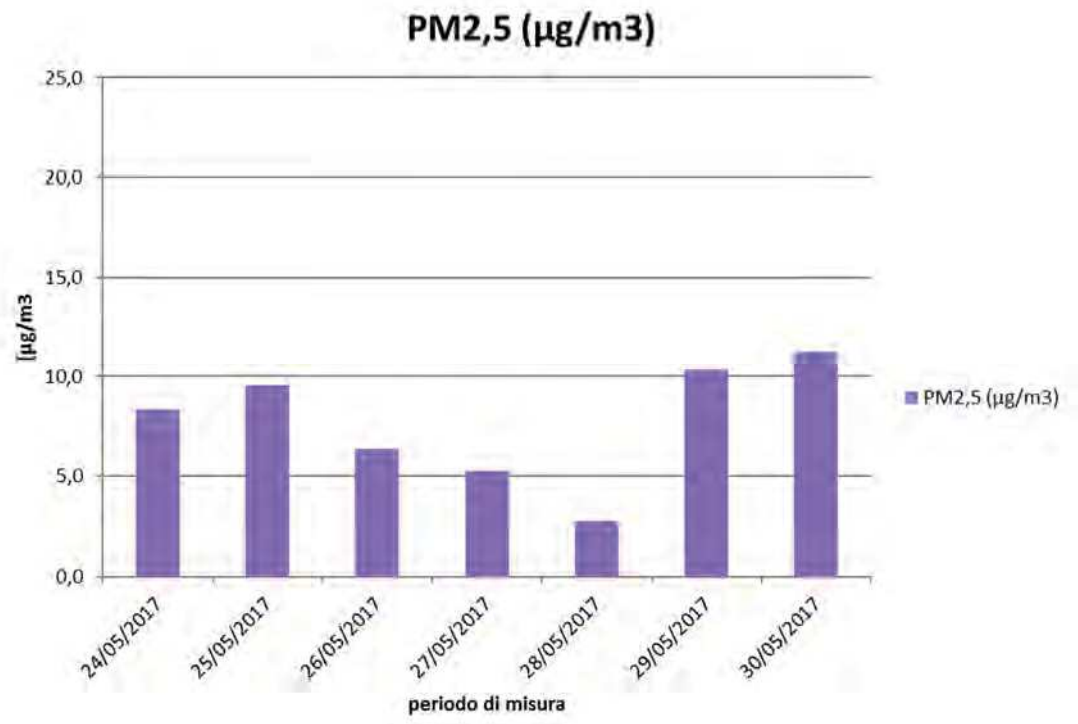


GRAFICO $PM_{2,5}$ – MEDIA GIORNALIERA



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ATM_11 - DATI METEO - Riepilogo giornaliero – periodo di misura dal 24/05/2017 al 30/05/2017							
Data	**Temperatura (°C)**	**Direzione vento**	**Velocità vento (m/s)**	**Piovosità (mm)**	**Umidità (%)**	**Pressione atm. (hPa)**	**Radiazione solare (W/m²)**
24/05/2017	25,6	WNW	0,9	0,3	48	1039,2	418
25/05/2017	22,4	NW	1,2	0,0	62	1035,7	233
26/05/2017	21,1	ESE	1,5	0,0	54	1036,5	145
27/05/2017	20,2	ENE	1,8	0,0	50	1040,9	176
28/05/2017	20,5	ENE	0,8	0,0	43	1041,5	340
29/05/2017	21	N	1,1	0,0	53	1041,3	327
30/05/2017	23,6	WSW	1,4	0,0	53	1041,1	287

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ATM_11 - DATI LABORATORIO – Riepilogo giornaliero – periodo di misura dal 24/05/2017 al 30/05/2017			
Data	**PTS (µg/m3)**	**PM_{10} (µg/m^3)**	**$PM_{2,5}$ (µg/m^3)**
24/05/2017	15,1	11,9	8,4
25/05/2017	18,8	14,7	9,5
26/05/2017	12,5	9,4	6,4
27/05/2017	10,5	7,8	5,3
28/05/2017	5,9	4,2	2,8
29/05/2017	22,1	15,7	10,4
30/05/2017	23,5	17,9	11,3

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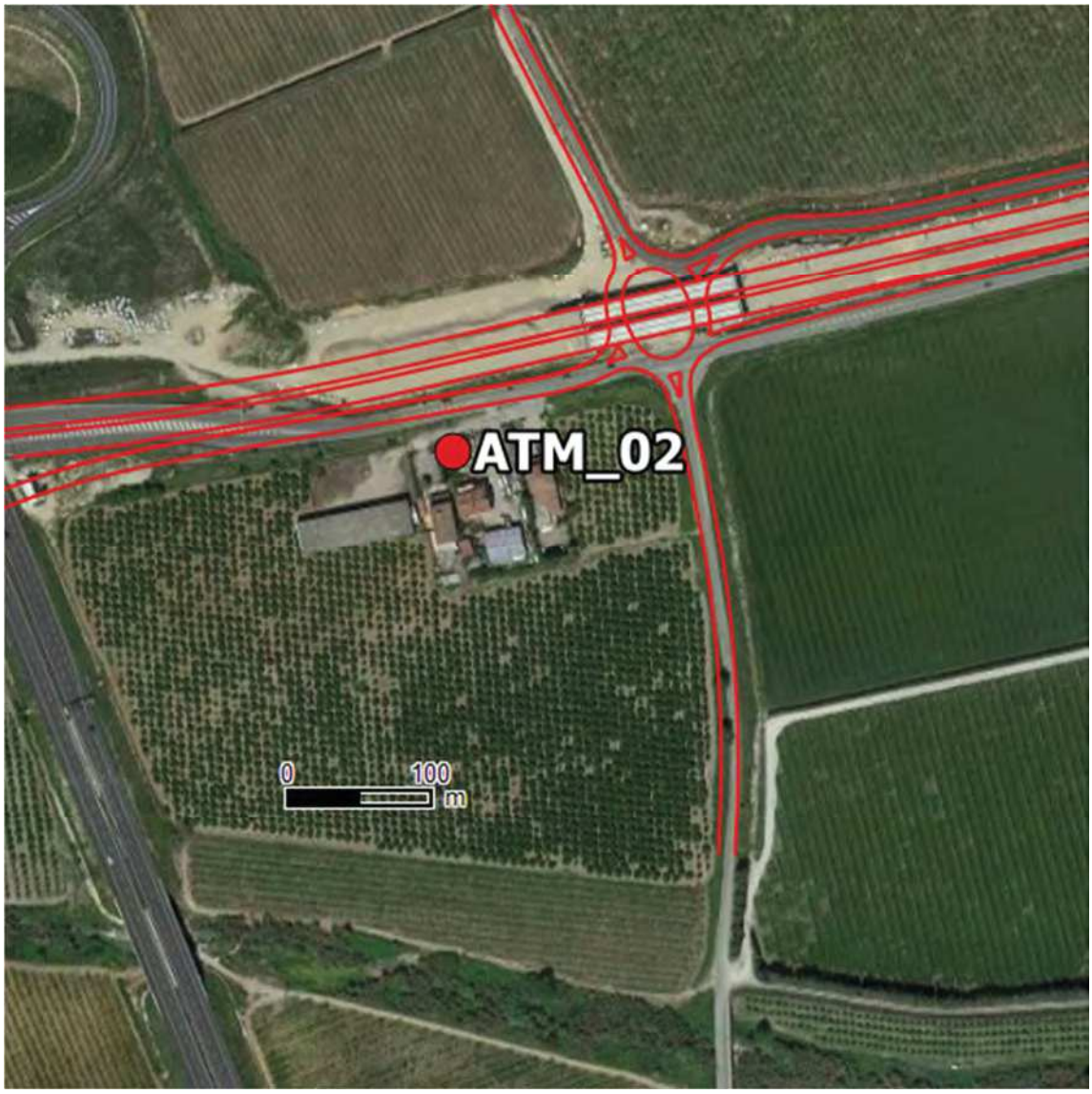
Il Direttore del laboratorio

RILIEVI DI GIUGNO 2017

SCHEDA PUNTO DI MISURA ATM 02

COORDINATE DI RIFERIMENTO: 16°14'32.33"E, 39°43'16.40"N

Fase di monitoraggio: Corso d'opera	Codice misura: ATM_02



LOCALIZZAZIONE GEOGRAFICA	
Località: C.da Margherita Comune: Saracena Provincia: Cosenza Regione: Calabria Distanza dal tracciato: 20 m Pk: 0+300,00	Accesso al punto di misura: Il punto è ubicato all'interno del piazzale di parcheggio al servizio di un'autofficina Sorgenti esistenti: Attività agricole, attività artigianale

PARAMETRI MISURATI				
PARAMETRO	METODO DI MISURA	COORDINATE		CODICI CAMPIONE
PM_{10}	Microbilancia	X:Vedi sopra	Y: Vedi sopra	NA
$PM_{2,5}$	Microbilancia	X:Vedi sopra	Y: Vedi sopra	NA
CO	Spettroscopia a raggi infrarossi	X:Vedi sopra	Y: Vedi sopra	NA
NO	Chemiluminescenza	X:Vedi sopra	Y: Vedi sopra	NA
NO_2	Chemiluminescenza	X:Vedi sopra	Y: Vedi sopra	NA
C_6H_6	Gascromatografia + PID	X:Vedi sopra	Y: Vedi sopra	NA
O_3	Fotometria ultravioletta	X:Vedi sopra	Y: Vedi sopra	NA
SO_2	Fluorescenza	X:Vedi sopra	Y: Vedi sopra	NA
Analisi metalli	Gravimetria			
Parametri Meteo	DV – VV – RAD – UR – PIOGGIA – T - PRESS			

SORGENTI INQUINANTI NON CONNESSE CON L'INFRASTRUTTURA
Attività agricole e attività artigianali

NOTE
Le lavorazioni in corso sono rappresentate da movimento terra per la realizzazione delle terre armate

Operatore:	Ing. Raffaele Didonna (Emonitoring s.r.l.)

ANALISI CHIMICHE

DATA (gg/mm/aaaa)	$PM_{2,5}$ [µg/m^3]	PM_{10} [µg/m^3]	CO [mg/m^3]	NO [µg/m^3]	NO_2 [µg/m^3]	C_6H_6 [µg/m^3]	O_3 [µg/m^3]	SO_2 [µg/m^3]
12/06/2017	11,01	24,54	0,91	2,59	11,93	0,04	105,05	2,07
13/06/2017	9,88	20,54	0,85	2,66	8,43	0,05	90,51	2,42
14/06/2017	12,08	19,80	0,95	2,74	13,21	0,08	83,45	2,12
15/06/2017	9,11	22,96	0,94	2,80	9,73	0,10	102,38	2,70
16/06/2017	12,00	27,33	0,93	2,38	13,62	0,07	81,19	2,83
17/06/2017	9,91	23,09	0,90	2,31	17,37	0,05	91,95	2,10
18/06/2017	8,25	20,05	1,03	2,10	11,03	0,10	90,19	2,20
19/06/2017	9,60	22,86	0,96	2,08	12,05	0,10	89,83	2,02
20/06/2017	10,86	26,36	0,94	2,32	11,80	0,08	92,87	1,99
21/06/2017	10,17	19,24	0,91	2,15	11,85	0,13	88,81	2,33
22/06/2017	9,47	21,40	0,86	2,49	15,12	0,13	86,5	2,69
23/06/2017	11,69	24,13	0,90	2,82	13,23	0,09	83,59	2,54
24/06/2017	12,60	20,88	0,91	2,50	9,87	0,09	92,34	2,68
25/06/2017	12,62	20,60	0,97	2,58	8,74	0,07	93,28	2,18
26/06/2017	8,89	16,49	1,48	3,83	18,78	0,04	69,87	1,44
MEDIA	10,54	22,02	0,96	2,56	12,45	0,08	89,454	2,29
MINIMO	2,20	16,49	0,85	2,08	8,43	0,04	69,87	1,44
MASSIMO	23,50	27,33	1,48	3,83	18,78	0,13	105,05	2,83

NOTE

I valori sopra riportati sono riferiti a medie giornaliere.

GRAFICO PM_{10} – MEDIA GIORNALIERA

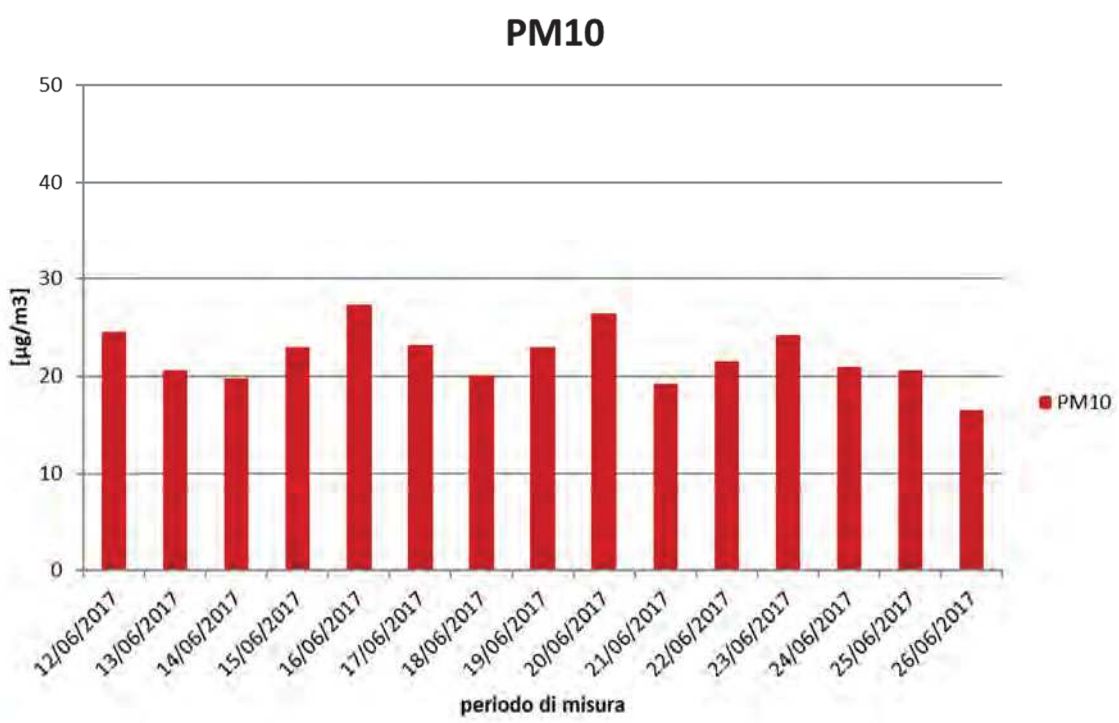


GRAFICO CO – MEDIA GIORNALIERA

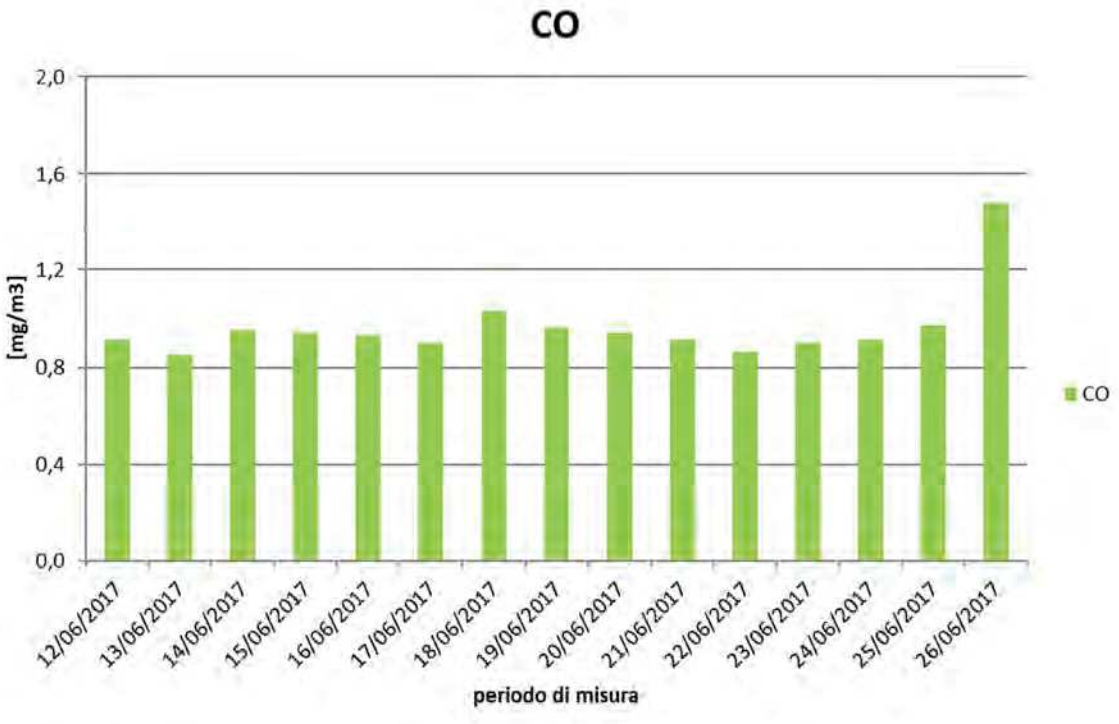


GRAFICO $PM_{2,5}$ – MEDIA GIORNALIERA

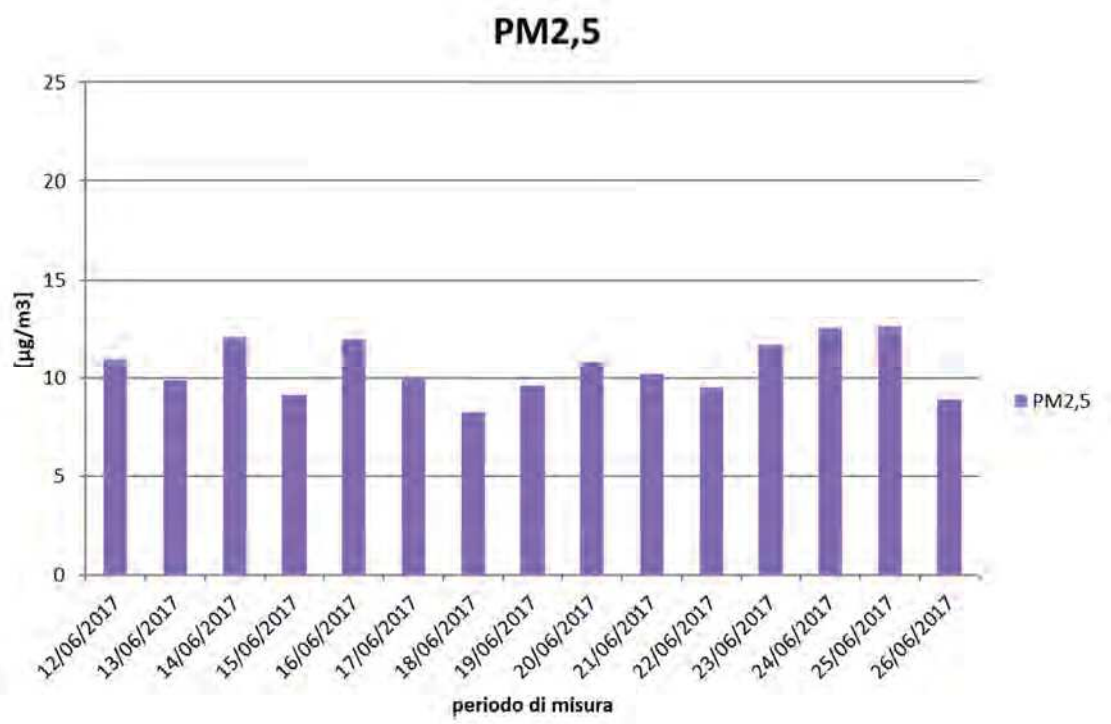


GRAFICO NO – MEDIA GIORNALIERA

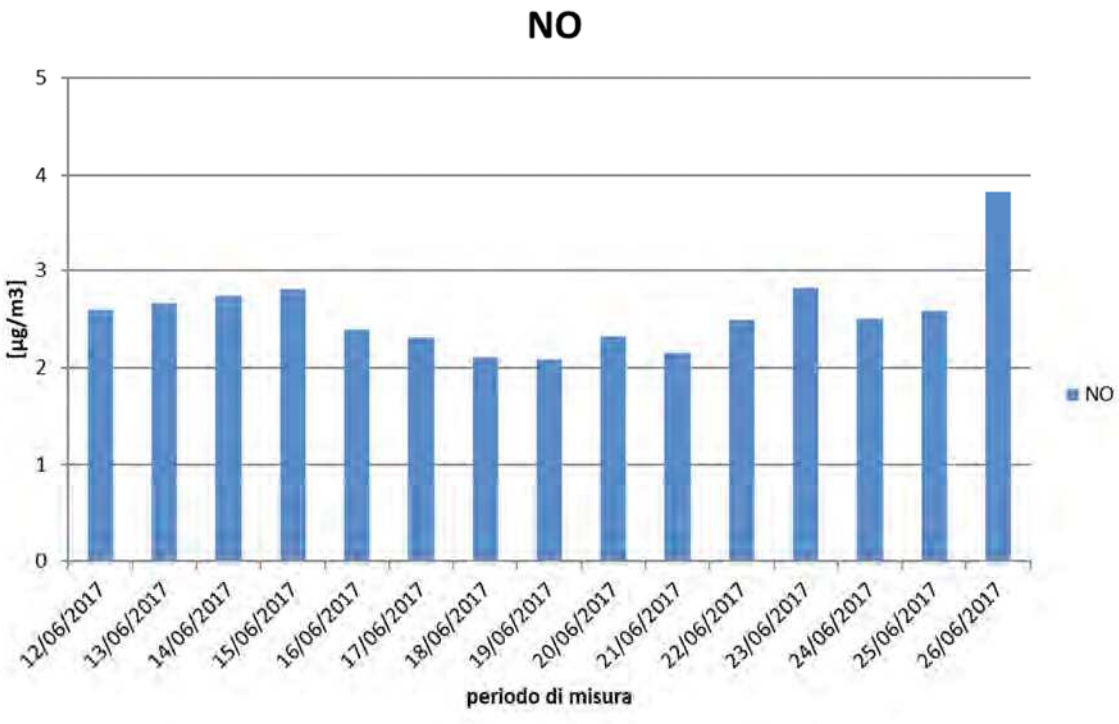


GRAFICO NO_2 – MEDIA GIORNALIERA

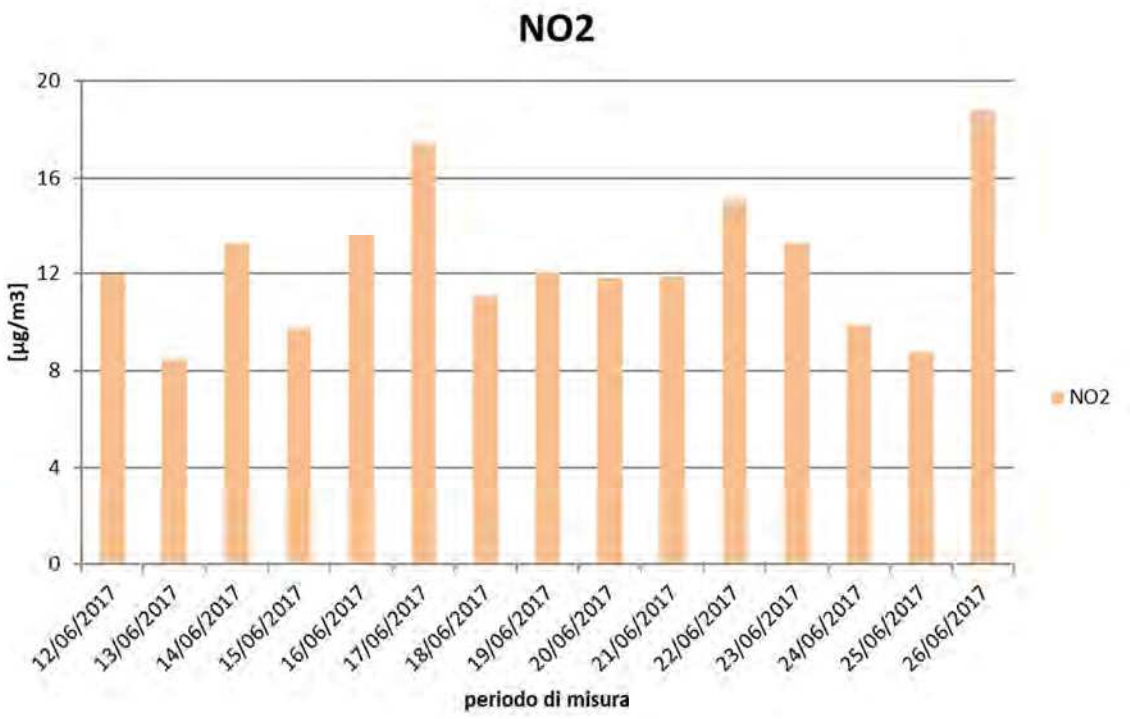


GRAFICO C_6H_6 – MEDIA GIORNALIERA

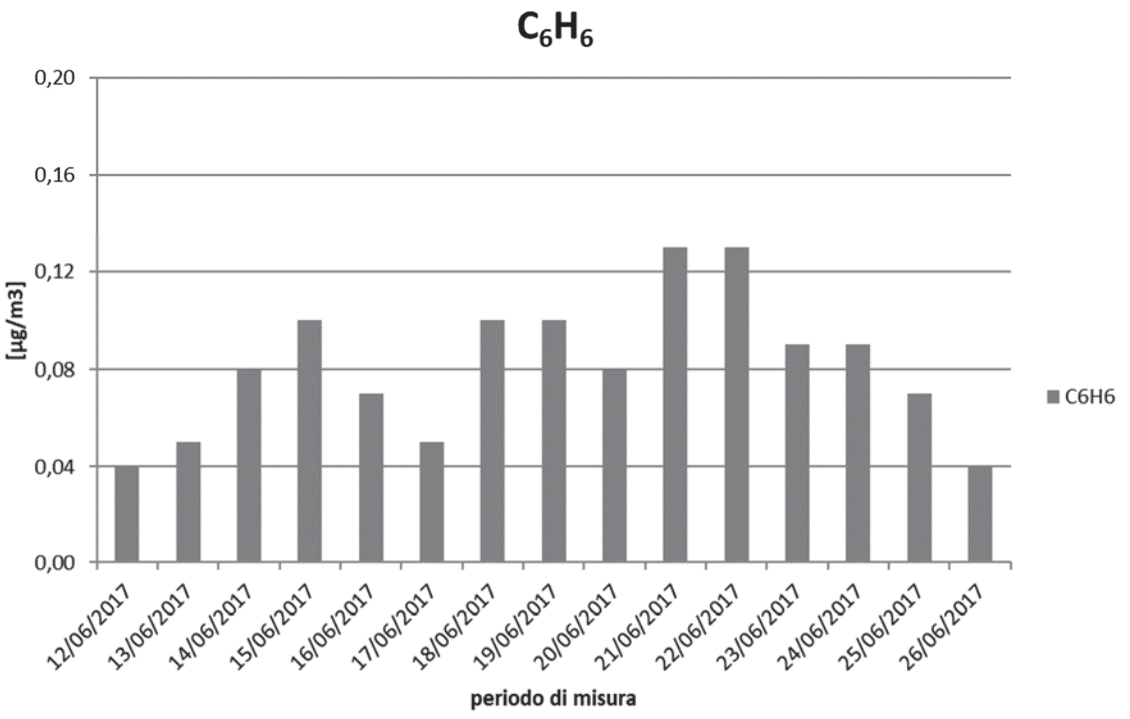


GRAFICO O_3 – MEDIA GIORNALIERA

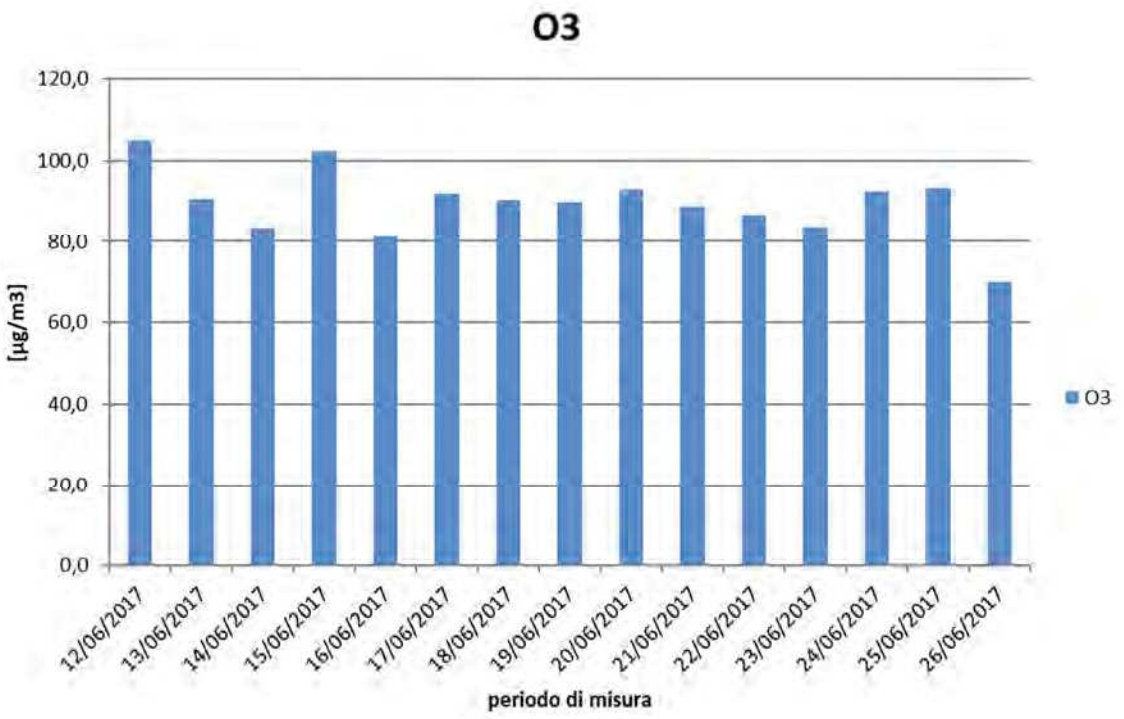
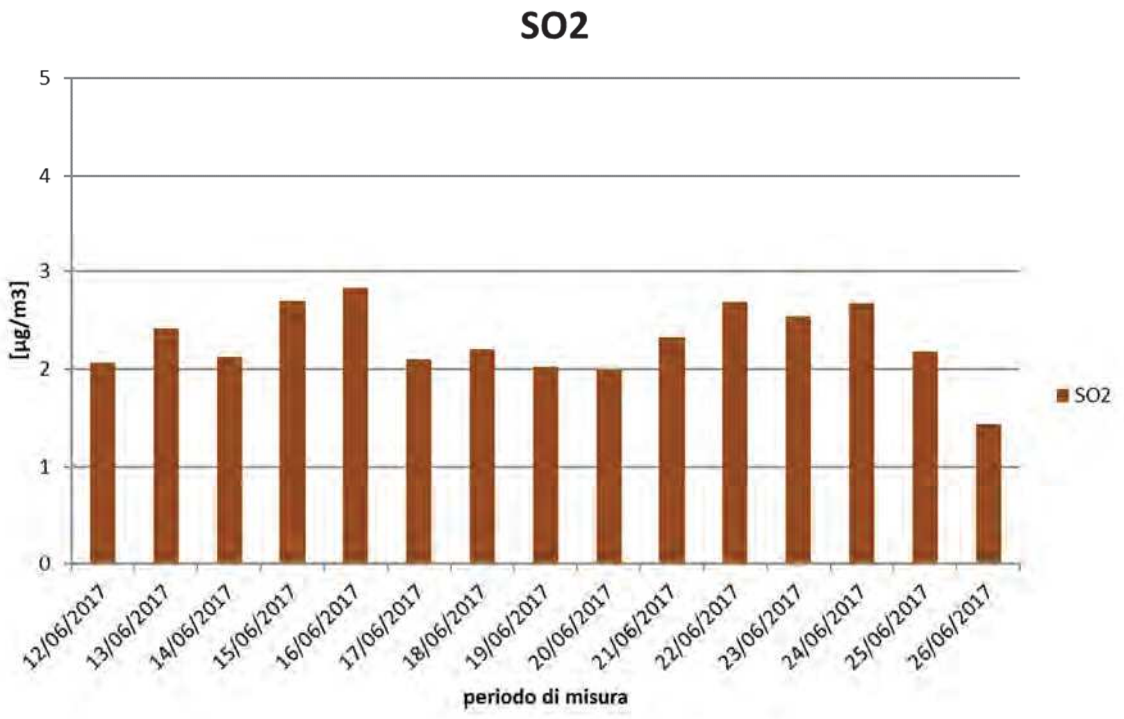


GRAFICO SO_2 – MEDIA GIORNALIERA



Emonitoring s.r.l.
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CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 12 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	W\m2	mm/H2O
01:00																		
02:00																		
03:00																		
04:00																		
05:00																		
06:00																		
07:00																		
08:00																		
09:00	0,80	1,90	2,20	12,60	15,30	93,60	22,40	9,30	0,00	0,00	3,50	1,20	185,0	21,3	56,9	1003,5	421,6	0,0
10:00	1,10	2,40	2,20	9,70	12,10	95,80	26,60	11,50	0,00	0,00	3,00	1,40	191,0	22,4	55,7	1003,7	598,7	0,0
11:00	0,90	1,90	3,00	9,90	14,00	97,70	27,60	12,10	0,00	0,00	2,10	1,90	190,0	23,8	55,4	1003,8	731,2	0,0
12:00	1,10	2,00	2,90	10,00	14,10	101,80	29,50	13,50	0,10	0,00	2,80	2,60	276,0	25,6	49,6	1003,6	848,2	0,0
13:00	1,00	2,30	2,40	12,80	15,70	104,10	24,80	12,40	0,10	0,00	3,10	3,20	284,0	26,1	49,6	1003,5	875,4	0,0
14:00	0,80	2,40	2,10	10,20	13,60	106,60	30,60	15,60	0,10	0,00	2,80	4,10	285,0	26,7	47,7	1003,4	871,0	0,0
15:00	0,70	2,00	2,90	13,80	17,40	109,70	20,60	10,10	0,00	0,00	3,60	3,40	296,0	26,2	45,6	1003,2	812,3	0,0
16:00	1,00	2,00	2,90	9,50	13,60	108,30	29,20	11,50	0,00	0,00	2,90	3,30	293,0	25,4	43,3	1003,2	595,3	0,0
17:00	0,90	2,00	3,00	12,10	15,70	111,50	25,80	9,90	0,00	0,00	2,60	3,10	291,0	23,6	41,7	1003,1	321,4	0,0
18:00	0,70	2,10	2,60	15,50	18,90	114,20	19,30	8,70	0,10	0,00	2,40	3,00	320,0	22,8	44,2	1003,0	315,2	0,0
19:00	1,10	2,00	2,70	13,00	16,50	115,80	28,40	12,20	0,00	0,00	2,30	2,90	318,0	22,1	48,5	1003,0	205,1	0,0
20:00	1,00	2,00	2,80	15,00	18,30	112,10	22,00	10,40	0,10	0,00	3,30	2,90	315,0	21,3	53,6	1003,2	41,2	0,0
21:00	0,90	2,00	2,80	13,30	17,40	108,40	21,00	9,60	0,10	0,00	3,90	2,80	313,0	20,9	54,3	1003,5	0,5	0,0
22:00	0,90	2,10	2,40	12,70	16,40	104,30	25,10	11,80	0,00	0,00	0,80	2,60	315,0	20,4	55,2	1003,6	0,0	0,0
23:00	0,80	2,20	2,70	11,40	14,80	99,60	20,40	9,90	0,10	0,00	1,70	2,40	321,0	20,2	57,8	1003,8	0,0	0,0
00:00	0,80	1,80	1,90	9,30	11,90	97,30	19,30	7,60	0,00	0,00	0,80	2,30	319,0	20,1	58,9	1004,1	0,0	0,0
Mean	0,91	2,07	2,59	11,93	15,36	105,05	24,54	11,01	0,04	0,00	2,60	2,69	282,00	23,06	51,13	1003,45	414,82	0,0
Min	0,7	1,8	1,9	9,3	11,9	93,6	19,3	7,6	0,0	0,0	0,8	1,2	185,0	20,1	41,7	1003,0	0,0	0,0
Max	1,1	2,4	3,0	15,5	18,9	115,8	30,6	15,6	0,1	0,0	3,9	4,1	321,0	26,7	58,9	1004,1	875,4	0,0

Metalli - Giornaliero µg/m³	
Cadmio	0,0046
Cromo	0,0570
Nichel	0,0052
Manganese	0,0021
Piombo	0,057
Rame	0,0013

Il Committente
Hi-Pro s.r.l.

ORDINE INGEGNERI PROVINCIA TARANTO
Dott. Ing. DIDONNA Raffaele
n° 2326
Civile Ambientale
Industriale
Informazione

Il Tecnico
dott. ing. Raffaele Didonna

Emonitoring s.r.l.
Via L. Einaudi, 97
75100 Matera - (MT)
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CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 13 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	W\m2	mm/H2O
01:00	0,70	1,70	3,10	7,30	11,20	92,40	15,30	7,60	0,00	0,00	2,80	2,10	321,0	20,6	59,2	1004,1	0,0	0,0
02:00	0,70	1,60	2,80	6,50	10,10	85,10	17,60	8,40	0,00	0,00	2,80	1,90	325,0	21,0	69,2	1004,3	0,0	0,0
03:00	0,90	1,50	2,10	6,80	9,50	78,20	18,50	9,80	0,10	0,00	2,10	1,50	332,0	21,0	72,7	1004,5	0,0	0,0
04:00	1,10	1,80	2,90	7,10	10,80	64,10	18,20	9,30	0,00	0,00	2,70	1,30	333,0	21,3	77,8	1004,6	0,0	0,0
05:00	0,90	1,90	2,60	8,70	12,10	56,50	17,90	11,00	0,00	0,00	1,50	0,60	328,0	21,4	77,6	1004,5	0,0	0,0
06:00	0,80	1,60	2,70	10,70	13,80	54,50	16,40	10,30	0,10	0,00	1,70	0,40	315,0	21,8	77,2	1004,2	8,9	0,0
07:00	1,00	1,80	2,90	10,40	14,10	52,90	18,60	12,10	0,10	0,00	1,00	0,30	320,0	22,4	76,9	1003,9	98,6	0,0
08:00	1,10	1,90	2,50	9,60	12,60	55,90	19,90	12,30	0,00	0,00	1,40	calma	n.d	22,6	73,8	1003,8	271,6	0,0
09:00	1,10	2,20	2,10	10,00	12,70	67,80	20,90	13,50	0,10	0,00	0,50	calma	n.d	24,0	71,9	1003,9	456,8	0,0
10:00	0,70	2,30	2,80	10,80	14,30	84,20	21,30	10,30	0,20	0,00	2,20	0,30	270,0	24,4	71,6	1003,7	665,8	0,0
11:00	0,90	2,50	2,30	11,80	15,40	96,30	21,80	8,60	0,10	0,00	2,80	1,10	275,0	24,5	69,0	1003,8	789,1	0,0
12:00	0,70	2,70	2,70	9,70	13,40	102,40	21,80	8,80	0,00	0,00	1,60	2,10	276,0	24,5	68,0	1004,1	852,6	0,0
13:00	0,80	3,10	2,40	9,30	12,80	105,60	20,20	9,60	0,00	0,00	1,70	2,20	269,0	24,6	68,0	1004,2	897,3	0,0
14:00	0,70	3,20	2,90	9,50	13,10	111,80	22,80	10,20	0,10	0,00	0,50	2,20	266,0	25,4	68,0	1003,8	881,2	0,0
15:00	1,00	3,60	2,80	8,60	12,30	109,80	25,80	13,50	0,00	0,00	1,20	2,30	248,0	25,5	66,8	1003,8	836,5	0,0
16:00	0,70	3,10	3,00	7,80	11,10	112,30	26,80	13,20	0,00	0,00	2,50	1,90	244,0	24,0	67,7	1003,8	596,3	0,0
17:00	1,10	3,00	3,20	7,90	12,50	115,80	31,20	14,60	0,00	0,00	1,90	1,80	96,0	23,9	70,7	1003,9	289,6	0,0
18:00	0,70	3,80	2,90	7,30	11,50	116,70	30,50	14,70	0,10	0,00	2,30	1,70	101,0	23,9	71,7	1003,7	258,6	0,0
19:00	1,00	3,60	2,70	5,70	9,30	118,90	23,60	10,20	0,00	0,00	1,30	1,80	251,0	23,5	72,1	1003,5	174,3	0,0
20:00	0,70	2,40	2,90	6,70	10,60	116,40	19,50	6,80	0,10	0,00	3,00	2,00	262,0	22,7	75,6	1003,2	39,6	0,0
21:00	0,80	2,50	2,40	9,10	12,50	110,10	17,40	6,60	0,00	0,00	1,30	1,90	258,0	22,7	77,9	1002,9	0,0	0,0
22:00	0,90	2,30	2,50	8,60	12,50	95,60	16,30	5,30	0,00	0,00	3,10	1,80	265,0	21,0	78,6	1002,8	0,0	0,0
23:00	0,70	2,20	2,50	6,70	10,90	89,30	15,40	5,20	0,10	0,00	2,80	1,60	255,0	20,6	79,6	1002,7	0,0	0,0
00:00	0,70	1,80	2,20	5,70	8,80	79,60	15,20	5,10	0,00	0,00	1,10	1,80	264,0	20,2	81,5	1002,5	0,0	0,0
Mean	0,85	2,42	2,66	8,43	12,00	90,51	20,54	9,88	0,05	0,00	1,91	1,57	267,00	22,81	72,63	1003,76	296,53	0,00
Min	0,7	1,5	2,1	5,7	8,8	52,9	15,2	5,1	0,0	0,0	0,5	0,3	96,0	20,2	59,2	1002,5	0,0	0,0
Max	1,1	3,8	3,2	11,8	15,4	118,9	31,2	14,7	0,2	0,0	3,1	2,3	333,0	25,5	81,5	1004,6	897,3	0,0

Metalli - Giornaliero µg/m³	
Cadmio	0,0047
Cromo	0,0011
Nichel	0,0018
Manganese	0,0027
Piombo	0,058
Rame	< 0,001

Il Committente
Hi-Pro s.r.l.

ORDINE INGEGNERI PROVINCIA TARANTO
Dott. Ing. DIDONNA Raffaele
n° 2326

Il Tecnico
dott. ing. Raffaele Didonna

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CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 14 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	Wm2	mm/H2O
01:00	0,70	1,80	2,10	6,50	9,30	74,70	10,30	9,10	0,00	0,00	0,70	1,50	275,0	20,1	76,8	1002,5	0,0	0,0
02:00	0,70	1,90	2,00	7,30	10,20	57,10	10,50	9,10	0,00	0,00	0,70	1,30	281,0	19,7	68,4	1002,6	0,0	0,0
03:00	0,90	1,90	1,70	8,90	11,50	48,80	11,10	9,70	0,10	0,00	1,10	2,10	296,0	19,5	66,6	1002,7	0,0	0,0
04:00	0,90	2,00	1,50	12,10	14,30	58,80	11,80	9,80	0,10	0,00	1,10	2,50	320,0	19,2	64,0	1002,7	0,0	0,0
05:00	0,90	2,00	1,90	13,60	16,90	71,10	12,30	10,30	0,10	0,00	1,30	2,80	335,0	19,6	62,2	1003,0	0,0	0,0
06:00	1,00	2,10	2,10	15,00	17,90	70,10	13,50	11,50	0,10	0,00	1,00	3,00	315,0	20,2	59,6	1003,1	10,2	0,0
07:00	1,00	2,10	2,40	21,30	24,50	59,80	17,10	11,80	0,10	0,00	1,10	1,40	312,0	20,8	58,5	1003,2	98,6	0,0
08:00	0,90	2,10	2,20	21,20	24,10	54,30	19,00	14,80	0,10	0,00	0,80	calma	n.p.	21,2	57,6	1003,8	278,6	0,0
09:00	1,00	2,20	2,00	22,60	25,30	85,70	23,80	15,20	0,00	0,00	0,80	calma	n.p.	22,5	54,9	1004,2	456,8	0,0
10:00	1,20	2,20	2,30	16,50	19,50	95,80	27,60	15,40	0,20	0,00	1,10	2,10	85,0	23,4	53,4	1004,1	653,8	0,0
11:00	1,10	2,20	2,60	15,70	19,60	103,00	28,40	15,60	0,20	0,00	1,00	4,20	92,0	25,9	51,8	1004,0	784,6	0,0
12:00	1,20	2,30	2,50	16,30	19,50	110,70	30,50	16,20	0,20	0,00	1,70	5,30	98,0	26,8	51,7	1003,8	868,9	0,0
13:00	0,90	2,30	2,80	17,10	20,50	102,70	31,80	16,20	0,10	0,00	1,90	6,20	174,0	28,1	49,6	1003,3	906,8	0,0
14:00	1,00	2,30	2,90	15,40	19,10	96,50	28,20	13,60	0,10	0,00	2,90	5,80	180,0	29,4	48,7	1003,3	968,6	0,0
15:00	1,00	2,40	3,10	8,90	12,70	93,00	23,90	13,60	0,10	0,00	2,80	4,60	195,0	29,2	47,4	1003,0	802,3	0,0
16:00	1,20	2,30	2,20	9,80	12,50	95,20	19,20	12,00	0,10	0,00	1,70	4,80	198,0	28,6	47,1	1002,8	421,7	0,0
17:00	0,90	2,30	2,10	10,20	13,10	98,50	11,50	11,30	0,10	0,00	1,20	4,10	274,0	27,3	47,3	1002,8	375,6	0,0
18:00	1,00	2,20	2,70	11,30	14,80	97,60	13,20	8,80	0,10	0,00	1,10	3,90	286,0	25,8	49,7	1002,6	371,2	0,0
19:00	0,90	2,20	1,90	10,20	13,00	97,50	26,10	11,40	0,00	0,00	0,70	2,10	275,0	24,6	50,9	1002,6	181,2	0,0
20:00	0,90	2,10	1,60	10,30	12,50	100,20	33,30	13,50	0,00	0,00	0,50	1,40	268,0	23,0	51,4	1002,9	56,8	0,0
21:00	1,10	2,10	2,50	15,40	18,70	93,10	22,40	16,00	0,00	0,00	0,70	0,60	273,0	22,5	57,7	1003,0	7,8	0,0
22:00	1,00	2,10	2,30	10,20	13,20	89,30	18,90	11,10	0,00	0,00	0,90	calma	n.p.	21,1	68,2	1003,1	0,0	0,0
23:00	0,80	1,90	14,60	12,10	15,40	76,00	17,90	7,00	0,10	0,00	0,70	calma	n.p.	20,4	68,5	1003,2	0,0	0,0
00:00	0,70	1,80	1,80	9,10	11,60	73,40	12,80	6,90	0,00	0,00	0,60	0,30	92,0	20,1	69,1	1003,5	0,0	0,0
Mean	0,95	2,12	2,74	13,21	16,24	83,45	19,80	12,08	0,08	0,00	1,17	3,00	231,20	23,29	57,55	1003,16	301,81	0,00
Min	0,70	1,80	1,50	6,50	9,30	48,80	10,30	6,90	0,00	0,00	0,50	0,30	85,00	19,20	47,10	1002,50	0,00	0,00
Max	1,20	2,40	14,60	22,60	25,30	110,70	33,30	16,20	0,20	0,00	2,90	6,20	335,00	29,40	76,80	1004,20	968,60	0,00

Metalli - Giornaliero µg/m³	
Cadmio	0,0038
Cromo	< 0,001
Nichel	0,0016
Manganese	0,0031
Piombo	0,079
Rame	0,0029

Il Committente
Hi-Pro s.r.l.

ORDINE INGEGNERI PROVINCIA TARANTO
Dott. Ing. DIDONNA Raffaele
n° 2826
Sezione A
Civile Ambientale
Industriale
Informazione

Il Tecnico
dott. ing. Raffaele Didonna

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CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 15 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	W\m2	mm/H2O
01:00	1,10	1,50	2,00	8,30	11,20	69,90	13,90	5,52	0,00	0,00	0,90	0,40	95,0	20,3	85,8	1003,0	0,0	0,0
02:00	0,90	1,70	2,20	9,60	12,50	71,30	14,50	5,75	0,00	0,00	0,50	0,50	121,0	20,5	87,0	1002,9	0,0	0,0
03:00	1,00	1,80	2,40	8,10	11,30	74,10	18,60	7,38	0,00	0,00	0,30	1,20	138,0	20,7	85,6	1002,9	0,0	0,0
04:00	0,90	2,30	3,10	11,90	15,50	84,80	19,50	7,74	0,10	0,00	0,20	0,20	141,0	22,4	85,0	1002,5	0,0	0,0
05:00	0,90	2,30	3,40	11,60	15,50	100,80	22,30	8,85	0,00	0,00	0,30	1,80	156,0	23,3	82,0	1002,5	0,0	0,0
06:00	1,00	2,60	3,50	9,60	13,50	104,80	22,80	9,05	0,10	0,00	1,10	0,50	178,0	23,7	81,0	1001,8	8,2	0,0
07:00	0,90	3,00	3,50	9,60	13,50	109,50	24,10	9,57	1,00	0,00	0,30	0,30	181,0	24,6	80,7	1001,7	93,6	0,0
08:00	0,90	3,10	3,60	8,00	12,00	112,50	23,60	9,37	0,10	0,00	0,20	calma	n.p.	25,2	79,8	1001,6	251,8	0,0
09:00	1,10	3,40	4,00	9,80	14,20	115,00	24,20	9,60	0,10	0,00	0,50	1,60	194,0	25,7	78,8	1001,3	421,3	0,0
10:00	0,80	3,40	3,00	8,00	11,40	116,90	25,60	10,16	0,10	0,00	0,20	2,20	201,0	26,1	74,0	1001,2	599,7	0,0
11:00	1,00	3,50	3,00	11,10	14,60	117,20	28,60	11,35	0,10	0,00	0,50	3,10	196,0	26,4	72,7	1001,1	723,5	0,0
12:00	1,10	3,50	2,90	12,90	16,30	114,00	29,70	11,79	0,00	0,00	3,30	4,50	188,0	27,0	67,1	1001,2	829,6	0,0
13:00	1,10	3,30	2,70	6,60	9,60	115,40	32,40	12,86	0,00	0,00	2,20	5,80	184,0	29,5	65,1	1001,3	571,4	0,0
14:00	0,90	2,90	2,10	6,70	9,10	116,60	33,80	13,41	0,10	0,00	0,60	4,60	185,0	29,5	65,1	1001,3	458,9	0,0
15:00	0,90	2,70	2,10	13,90	16,50	118,30	35,70	14,17	0,10	0,00	0,50	4,40	198,0	28,8	66,9	1001,4	523,7	0,0
16:00	1,10	2,30	2,20	12,70	15,40	119,70	31,20	12,38	0,00	0,00	0,50	2,10	225,0	27,9	69,0	1001,6	517,2	0,0
17:00	1,00	2,10	2,30	8,30	10,90	116,80	29,80	11,83	0,00	0,00	0,80	1,90	286,0	27,0	70,3	1001,8	316,8	0,0
18:00	0,90	2,20	2,60	8,10	11,00	115,60	23,50	9,33	0,10	0,00	1,50	1,50	321,0	24,3	71,6	1001,9	310,2	0,0
19:00	1,00	3,30	3,00	12,60	16,10	109,10	21,10	8,37	0,10	0,00	1,10	0,40	343,0	23,9	72,1	1002,5	246,8	0,0
20:00	0,80	3,30	3,70	8,30	12,40	105,00	18,40	7,30	0,20	0,00	3,10	calma	n.p.	23,0	72,6	1002,6	49,5	0,0
21:00	1,10	3,40	3,00	6,60	9,90	99,60	15,50	6,15	0,10	0,00	2,60	0,30	335,0	22,5	77,0	1002,9	1,8	0,0
22:00	0,80	2,50	2,80	9,20	12,40	93,30	12,30	4,88	0,10	0,00	2,00	0,50	324,0	22,3	77,5	1003,0	0,0	0,0
23:00	0,70	2,50	2,10	8,30	10,70	86,00	15,20	6,03	0,00	0,00	2,60	0,50	318,0	21,1	80,0	1002,3	0,0	0,0
00:00	0,70	2,20	2,10	13,70	16,30	70,80	14,70	5,83	0,00	0,00	1,70	0,30	302,0	20,8	81,6	1001,9	0,0	0,0
Mean	0,94	2,70	2,80	9,73	12,99	102,38	22,96	9,11	0,10	0,00	1,15	1,75	218,64	24,44	76,18	1002,01	246,83	0,00
Min	0,70	1,50	2,00	6,60	9,10	69,90	12,30	4,88	0,00	0,00	0,20	0,20	95,00	20,30	65,10	1001,10	0,00	0,00
Max	1,10	3,50	4,00	13,90	16,50	119,70	35,70	14,17	1,00	0,00	3,30	5,80	343,00	29,50	87,00	1003,00	829,60	0,00

Metalli - Giornaliero µg/m³	
Cadmio	0,0015
Cromo	0,0013
Nichel	0,0022
Manganese	< 0,001
Piombo	0,088
Rame	< 0,001

Il Committente
Hi-Pro s.r.l.

Il Tecnico
dott. ing. Raffaele Didonna

ORDINE INGEGNERI PROVINCIA TARANTO
Dott. Ing. DIDONNA Raffaele
n° 2826
Sezione A
Settore:
Civile Ambientale
Industriale
Informazione

Emonitoring s.r.l.
Via L. Einaudi, 97
75100 Matera - (MT)
Tel./Fax 0835 332455

CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 16 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	W\m2	mm/H2O
01:00	0,80	1,80	2,30	10,20	13,30	61,00	15,90	6,90	0,00	0,00	1,00	0,40	298,0	20,3	82,3	1001,8	0,0	0,0
02:00	0,90	2,20	2,30	10,60	13,70	59,60	17,50	7,60	0,00	0,00	1,10	0,30	285,0	20,7	79,3	1002,0	0,0	0,0
03:00	0,90	2,20	2,30	12,20	15,40	56,10	24,10	10,40	0,00	0,00	1,20	calma	n.p.	20,7	73,7	1002,7	0,0	0,0
04:00	1,10	2,70	2,30	12,50	15,80	59,60	28,40	12,30	0,10	0,00	2,20	0,50	276,0	22,1	71,4	1003,0	0,0	0,0
05:00	0,90	2,90	2,40	13,80	17,30	63,60	28,90	12,50	0,10	0,00	1,10	1,30	269,0	22,3	70,9	1003,1	0,0	0,0
06:00	0,90	2,90	2,40	14,30	17,80	56,60	30,40	14,20	0,10	0,00	0,30	1,60	228,0	23,3	68,3	1003,4	9,7	0,0
07:00	0,80	2,90	2,40	14,70	18,20	49,60	31,50	14,10	0,10	0,00	0,70	2,50	185,0	25,5	64,3	1003,4	101,3	0,0
08:00	0,80	2,90	2,50	14,90	18,50	50,50	32,20	15,60	0,20	0,00	1,50	3,40	196,0	26,6	63,8	1003,3	275,6	0,0
09:00	1,10	3,10	2,50	15,00	18,60	74,60	32,30	14,00	0,10	0,00	0,80	2,20	199,0	26,8	61,8	1003,2	486,9	0,0
10:00	0,80	3,20	2,60	16,40	20,20	79,10	33,30	14,40	0,20	0,00	0,50	1,80	201,0	26,8	60,8	1003,2	653,8	0,0
11:00	0,80	3,70	2,60	15,00	18,70	93,80	33,50	14,50	0,10	0,00	0,20	5,00	275,0	30,1	59,7	1002,2	786,4	0,0
12:00	1,00	3,80	2,60	14,80	18,50	106,40	33,70	14,10	0,10	0,00	0,60	3,00	264,0	34,2	57,6	1002,2	869,3	0,0
13:00	1,10	3,90	2,50	14,00	17,60	112,30	35,10	15,20	0,10	0,00	1,60	calma	n.p.	34,9	56,9	1002,0	895,6	0,0
14:00	1,10	3,90	2,20	12,80	16,00	111,00	32,70	14,10	0,10	0,00	0,20	calma	n.p.	35,8	55,0	1002,0	881,3	0,0
15:00	0,80	3,50	2,10	11,70	14,70	110,70	30,80	13,30	0,00	0,00	0,40	0,40	281,0	36,2	63,9	1001,9	836,7	0,0
16:00	1,00	2,80	2,30	11,70	14,90	102,60	25,20	10,90	0,00	0,00	0,70	0,50	274,0	35,1	65,8	1001,6	601,2	0,0
17:00	1,10	1,50	2,30	10,30	13,40	108,00	18,80	8,10	0,00	0,00	0,50	0,90	265,0	33,8	68,8	1001,5	369,9	0,0
18:00	1,10	1,50	2,30	12,60	15,90	107,00	17,40	8,20	0,10	0,00	0,30	1,80	92,0	31,5	73,6	1001,5	275,4	0,0
19:00	1,00	1,70	2,50	15,00	18,60	98,30	19,40	9,30	0,10	0,00	0,80	1,90	96,0	29,6	73,6	1001,6	196,7	0,0
20:00	0,80	3,60	2,50	16,50	20,20	93,60	24,10	10,40	0,00	0,00	0,30	2,30	68,0	27,3	74,9	1002,6	54,3	0,0
21:00	1,10	3,80	2,60	16,80	20,70	81,00	32,60	14,10	0,00	0,00	0,40	2,60	75,0	26,2	75,4	1002,7	9,2	0,0
22:00	0,90	2,90	2,30	16,30	19,80	79,10	29,30	12,70	0,00	0,00	0,20	3,10	105,0	24,1	78,4	1002,8	0,0	0,0
23:00	0,80	2,80	2,20	13,60	16,80	72,50	27,60	11,90	0,10	0,00	0,20	1,50	128,0	21,1	81,3	1003,0	0,0	0,0
00:00	0,80	1,60	2,20	11,10	14,20	62,00	21,30	9,20	0,00	0,00	0,10	0,80	136,0	20,7	82,2	1003,6	0,0	0,0
Mean	0,93	2,83	2,38	13,62	17,03	81,19	27,33	12,00	0,07	0,00	0,70	1,80	199,81	27,32	69,32	1002,51	304,30	0,00
Min	0,80	1,50	2,10	10,20	13,30	49,60	15,90	6,90	0,00	0,00	0,10	0,30	68,00	20,30	55,00	1001,50	0,00	0,00
Max	1,10	3,90	2,60	16,80	20,70	112,30	35,10	15,60	0,20	0,00	2,20	5,00	298,00	36,20	82,30	1003,60	895,60	0,00

Metalli - Giornaliero µg/m³	
Cadmio	0,0017
Cromo	0,0016
Nichel	0,0022
Manganese	< 0,001
Piombo	0,007
Rame	< 0,001

Il Committente
Hi-Pro s.r.l.

ORDINE INGEGNERI PROVINCIA TARANTO
Sezione A
Dott. Ing. DIDONNA RAFFAELE
n° 2326
Settore:
Civile Ambientale
Industriale
Informazione

Il Tecnico
dott. ing. Raffaele Didonna

Emonitoring s.r.l.
Via L. Einaudi, 97
75100 Matera - (MT)
Tel./Fax 0835 332455

CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 17 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	W\m2	mm/H2O
01:00	0,80	1,40	1,80	15,00	17,40	69,10	22,70	9,00	0,10	0,00	0,30	0,60	145,0	20,3	81,5	1003,6	0,0	0,0
02:00	0,90	1,40	1,90	15,00	17,50	72,00	23,70	9,40	0,10	0,00	0,50	0,50	148,0	20,4	79,3	1003,6	0,0	0,0
03:00	0,90	1,50	2,00	18,20	20,92	70,80	24,50	9,70	0,00	0,00	0,40	0,80	165,0	21,3	78,9	1003,3	0,0	0,0
04:00	1,00	1,50	2,10	18,40	21,23	71,50	30,20	12,00	0,10	0,00	0,10	0,90	178,0	23,0	77,8	1003,3	0,0	0,0
05:00	1,10	1,80	2,10	19,60	22,47	66,10	31,70	12,60	0,10	0,00	0,00	1,20	201,0	23,9	77,7	1002,9	0,0	0,0
06:00	0,90	1,80	2,30	20,20	23,30	81,10	24,20	9,60	0,10	0,00	0,20	1,50	225,0	24,3	70,7	1002,4	9,7	0,0
07:00	1,00	2,20	2,30	21,20	24,34	72,70	18,90	7,50	0,00	0,00	0,80	1,90	236,0	26,6	70,3	1002,4	99,6	0,0
08:00	1,10	2,20	2,40	21,30	24,85	68,50	28,80	11,40	0,00	0,00	1,50	2,60	231,0	27,4	69,9	1002,3	268,9	0,0
09:00	1,00	2,30	2,60	21,40	25,16	86,20	20,90	9,10	0,00	0,00	2,30	2,80	241,0	29,3	69,6	1002,2	488,3	0,0
10:00	0,80	2,30	2,60	22,00	25,79	93,50	16,70	7,30	0,10	0,00	2,90	3,40	245,0	32,0	64,4	1002,0	628,6	0,0
11:00	0,90	2,90	2,70	20,60	24,43	102,70	27,50	12,00	0,10	0,00	3,40	3,50	321,0	32,1	60,7	1002,0	781,3	0,0
12:00	0,90	3,40	2,60	20,20	23,91	102,70	23,80	10,40	0,10	0,00	0,60	4,30	334,0	32,1	60,0	1002,1	876,8	0,0
13:00	1,00	3,50	2,60	19,20	22,86	107,10	28,00	12,20	0,10	0,00	1,50	3,30	331,0	32,2	54,2	1002,5	875,9	0,0
14:00	1,10	3,00	2,50	18,40	21,91	109,90	31,50	13,90	0,10	0,00	2,70	3,90	310,0	32,3	54,6	1002,5	874,3	0,0
15:00	0,90	1,90	2,50	17,10	20,55	111,20	21,70	9,60	0,00	0,00	2,00	2,20	274,0	33,9	54,9	1002,9	821,3	0,0
16:00	0,80	1,60	2,20	15,20	18,24	114,60	28,40	12,50	0,10	0,00	1,20	1,80	261,0	33,4	55,3	1003,0	598,8	0,0
17:00	0,90	1,50	1,90	14,90	17,46	113,10	23,70	10,50	0,00	0,00	0,80	calma	n.p.	32,6	57,4	1003,0	368,3	0,0
18:00	0,80	1,40	2,10	12,50	15,18	111,30	22,50	9,90	0,10	0,00	0,30	calma	n.p.	29,8	57,9	1003,3	271,3	0,0
19:00	0,80	1,40	2,20	11,30	14,03	110,90	21,40	9,40	0,10	0,00	0,80	1,70	198,0	27,8	58,5	1003,7	186,9	0,0
20:00	0,90	2,10	2,20	13,80	16,63	110,40	16,00	7,10	0,00	0,00	1,70	2,10	195,0	27,8	60,1	1003,7	49,6	0,0
21:00	0,90	3,50	2,30	17,30	20,38	105,00	17,70	8,60	0,00	0,00	1,80	2,90	201,0	27,6	67,1	1003,7	10,1	0,0
22:00	0,80	2,70	2,60	15,00	18,30	99,50	18,10	8,80	0,00	0,00	1,00	2,80	186,0	26,2	69,0	1003,7	0,0	0,0
23:00	0,70	1,70	2,60	14,80	18,09	81,30	16,30	7,90	0,00	0,00	0,60	3,60	174,0	24,2	71,6	1003,7	0,0	0,0
00:00	0,70	1,50	2,40	14,20	17,26	75,50	15,20	7,40	0,00	0,00	0,30	2,70	183,0	20,7	78,1	1003,7	0,0	0,0
Mean	0,90	2,10	2,31	17,37	20,51	91,95	23,09	9,91	0,05	0,00	1,15	2,32	226,50	27,55	66,65	1002,98	300,40	0,00
Min	0,70	1,40	1,80	11,30	14,03	66,10	15,20	7,10	0,00	0,00	0,00	0,50	145,00	20,30	54,20	1002,00	0,00	0,00
Max	1,10	3,50	2,70	22,00	25,79	114,60	31,70	13,90	0,10	0,00	3,40	4,30	334,00	33,90	81,50	1003,70	876,80	0,00

Metalli - Giornaliero µg/m³	
Cadmio	0,0010
Cromo	0,0012
Nichel	0,0049
Manganese	< 0,001
Piombo	0,029
Rame	0,0037

Il Committente
Hi-Pro s.r.l.

ORDINE [illegible]
Dott. Ing. DIDONNA Raffaele
n° 2326
[illegible] Ambientale
Industriale
In Pensione

Il Tecnico
dott. ing. Raffaele Didonna

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CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 18 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	W\m2	mm/H2O
01:00	1,10	1,60	1,90	12,10	14,46	74,80	15,70	6,20	0,00	0,00	0,10	2,10	176,0	22,7	72,7	1001,6	0,0	0,0
02:00	1,00	1,60	2,10	10,90	13,42	76,70	16,80	6,70	0,00	0,00	0,10	1,80	168,0	22,8	72,0	1001,7	0,0	0,0
03:00	1,10	1,90	2,10	11,80	14,35	80,60	19,50	7,70	0,00	0,00	0,20	1,70	174,0	23,0	70,9	1002,0	0,0	0,0
04:00	1,10	1,90	2,20	9,00	11,56	76,80	21,80	8,60	0,10	0,00	0,20	1,10	169,0	25,3	67,0	1002,5	0,0	0,0
05:00	1,10	2,10	2,30	9,60	12,29	69,60	17,00	6,70	0,10	0,00	0,20	1,20	156,0	25,5	66,0	1002,8	0,0	0,0
06:00	0,90	2,30	2,30	9,10	11,77	71,70	14,00	5,60	0,10	0,00	0,80	2,20	158,0	26,5	61,2	1003,1	10,2	0,0
07:00	1,10	2,40	2,20	11,20	13,84	51,10	16,20	6,70	0,00	0,00	0,20	2,80	182,0	26,5	60,2	1003,3	101,2	0,0
08:00	0,90	2,60	2,20	12,20	15,06	53,20	18,60	7,70	0,10	0,00	0,30	3,30	96,0	27,6	58,8	1003,4	275,6	0,0
09:00	1,00	2,70	2,30	11,10	14,01	82,40	19,40	8,00	0,20	0,00	0,30	4,10	101,0	28,3	58,6	1003,6	496,3	0,0
10:00	1,10	2,80	1,80	10,10	12,44	91,10	15,80	6,50	0,20	0,00	0,40	4,40	86,0	29,2	55,4	1003,5	635,4	0,0
11:00	1,10	2,70	2,40	12,80	15,89	95,60	18,20	7,50	0,10	0,00	1,20	3,90	82,0	29,5	53,9	1002,6	784,3	0,0
12:00	1,00	2,60	2,00	9,40	11,92	88,70	23,60	9,80	0,10	0,00	0,30	3,50	93,0	32,1	51,7	1002,4	884,6	0,0
13:00	0,90	2,40	1,90	12,60	15,16	98,30	26,90	12,30	0,20	0,00	0,30	3,70	98,0	33,6	50,6	1002,3	898,9	0,0
14:00	0,90	2,20	1,90	13,50	16,10	102,00	29,10	13,30	0,10	0,00	1,10	4,10	110,0	34,5	57,5	1001,7	881,2	0,0
15:00	1,00	2,10	2,20	12,50	15,41	118,90	33,50	15,30	0,00	0,00	0,30	3,20	115,0	33,9	58,4	1001,5	836,5	0,0
16:00	1,00	2,00	2,00	11,70	14,36	121,20	24,40	11,10	0,20	0,00	0,80	2,20	109,0	33,4	59,8	1001,6	635,2	0,0
17:00	1,00	1,50	2,00	11,50	14,15	129,60	28,10	12,80	0,20	0,00	0,30	1,60	188,0	33,2	61,6	1003,3	398,6	0,0
18:00	1,10	1,50	2,20	12,10	14,99	111,90	28,60	10,20	0,30	0,00	1,60	1,80	192,0	31,4	62,4	1003,4	331,2	0,0
19:00	1,00	2,30	2,30	11,50	14,47	113,50	22,20	7,90	0,10	0,00	0,20	1,90	187,0	30,2	66,4	1003,5	201,3	0,0
20:00	1,10	2,40	2,00	12,50	15,20	105,40	14,40	5,10	0,10	0,00	0,30	0,90	174,0	28,7	69,7	1003,6	65,6	0,0
21:00	1,00	2,50	1,80	9,90	12,16	104,50	15,70	5,60	0,10	0,00	0,40	0,60	221,0	27,7	70,3	1003,3	11,1	0,0
22:00	1,10	2,80	2,40	9,30	12,16	96,90	14,60	5,20	0,00	0,00	0,20	0,50	229,0	26,9	73,2	1003,1	0,0	0,0
23:00	1,10	2,30	2,10	10,00	12,58	78,70	13,90	6,20	0,10	0,00	0,30	calma	n.p.	22,1	74,8	1003,0	0,0	0,0
00:00	1,10	1,70	1,90	8,20	10,50	71,30	13,20	5,20	0,00	0,00	0,20	calma	n.p.	20,0	77,6	1002,3	0,0	0,0
Mean	1,03	2,20	2,10	11,03	13,68	90,19	20,05	8,25	0,10	0,00	0,43	2,39	148,36	28,11	63,78	1002,71	310,30	0,00
Min	0,90	1,50	1,80	8,20	10,50	51,10	13,20	5,10	0,00	0,00	0,10	0,50	82,00	20,00	50,60	1001,50	0,00	0,00
Max	1,10	2,80	2,40	13,50	16,10	129,60	33,50	15,30	0,30	0,00	1,60	4,40	229,00	34,50	77,60	1003,60	898,90	0,00

Metalli - Giornaliero µg/m³	
Cadmio	0,0012
Cromo	< 0,001
Nichel	0,0018
Manganese	< 0,001
Piombo	0,024
Rame	0,0031

Il Committente
Hi-Pro s.r.l.

ORDINE INGEGNERI PROVINCIA TARANTO
Dott. Ing. DIDONNA Raffaele
n° 2826
Sezione A
Il Tecnico
dott. ing. Raffaele Didonna
Civile Ambientale
Industriale
Informazione

Emonitoring s.r.l.
Via L. Einaudi, 97
75100 Matera - (MT)
Tel./Fax 0835 332455

CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 19 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	W\m2	mm/H2O
01:00	0,90	1,60	2,00	9,60	12,09	70,40	13,10	4,70	0,00	0,00	0,10	0,40	235,00	19,5	66,7	1002,4	0,0	0,0
02:00	0,90	1,70	1,90	10,10	12,51	72,90	14,90	5,35	0,10	0,00	0,10	0,80	265,00	19,3	66,4	1002,4	0,0	0,0
03:00	1,00	1,60	1,80	11,30	13,65	69,40	20,40	7,32	0,00	0,00	0,20	1,20	272,00	18,9	65,0	1002,0	0,0	0,0
04:00	1,00	1,80	2,00	12,10	14,56	62,00	20,20	8,67	0,00	0,00	0,10	1,40	275,00	18,5	64,2	1002,0	0,0	0,0
05:00	0,10	1,80	2,10	10,30	12,80	62,60	20,20	8,67	0,00	0,00	0,20	1,60	289,00	18,2	62,1	1001,7	0,0	0,0
06:00	1,20	1,90	2,00	14,30	16,83	50,30	19,40	8,32	0,00	0,00	0,30	1,40	291,00	18,5	57,9	1001,7	9,4	0,0
07:00	1,10	2,70	2,60	13,90	17,03	26,40	17,50	7,51	0,00	0,00	0,20	1,40	288,00	18,6	56,9	1001,3	98,6	0,0
08:00	1,10	2,00	2,30	11,10	14,01	70,40	22,90	9,82	0,10	0,00	0,30	1,50	275,00	18,6	56,2	1001,1	254,3	0,0
09:00	1,20	1,80	2,00	12,40	15,05	84,00	25,00	9,98	0,00	0,00	0,30	1,50	291,00	19,3	55,6	1001,3	485,1	0,0
10:00	1,20	2,00	2,50	14,10	17,35	93,40	36,50	14,56	0,10	0,00	0,40	1,60	269,00	21,0	54,9	1001,4	601,2	0,0
11:00	1,10	2,20	2,30	13,60	16,62	107,50	33,80	13,49	0,10	0,00	0,90	1,60	273,00	21,6	54,5	1001,4	763,4	0,0
12:00	1,10	1,60	2,00	14,90	17,67	114,80	31,80	12,69	0,20	0,00	0,40	1,80	281,00	22,7	52,6	1001,6	851,2	0,0
13:00	1,20	2,20	2,30	15,30	18,40	113,70	34,10	13,61	0,30	0,00	0,30	2,70	296,00	23,8	50,2	1001,9	860,2	0,0
14:00	1,20	2,60	2,20	16,00	18,97	121,70	29,40	11,73	0,30	0,00	1,40	3,60	295,00	25,6	48,6	1002,2	859,3	0,0
15:00	1,00	2,50	2,30	14,70	17,72	118,70	30,70	13,42	0,20	0,00	0,30	3,60	298,00	26,1	46,7	1002,5	798,7	0,0
16:00	1,00	2,60	2,40	12,30	15,32	115,70	25,30	11,06	0,20	0,00	0,70	3,50	315,00	25,7	47,0	1002,4	598,8	0,0
17:00	1,00	2,50	2,40	10,20	13,13	109,50	32,90	14,38	0,20	0,00	0,50	3,70	320,00	24,1	47,6	1002,3	364,3	0,0
18:00	1,10	2,30	1,80	11,20	13,55	111,20	20,60	9,00	0,20	0,00	0,30	3,20	331,00	23,7	55,2	1002,2	311,2	0,0
19:00	1,00	2,60	2,00	9,20	11,70	109,80	18,50	8,45	0,10	0,00	0,10	2,40	348,00	22,8	60,1	1002,1	186,4	0,0
20:00	1,00	1,70	1,90	14,30	16,92	104,70	18,60	8,50	0,10	0,00	0,20	1,70	355,00	22,1	61,0	1001,9	45,3	0,0
21:00	0,80	1,90	1,90	10,30	12,74	98,70	19,50	8,91	0,10	0,00	0,30	1,60	352,00	21,4	61,8	1001,8	10,1	0,0
22:00	0,70	1,60	1,80	9,90	12,16	95,40	15,30	7,18	0,00	0,00	0,20	1,40	349,00	21,2	64,4	1001,7	0,0	0,0
23:00	0,60	1,70	1,80	9,50	11,75	91,00	13,80	6,48	0,10	0,00	0,20	1,20	344,00	20,8	65,8	1001,4	0,0	0,0
00:00	0,60	1,60	1,70	8,60	10,71	81,70	14,20	6,67	0,00	0,00	0,10	1,30	332,00	20,2	68,1	1001,3	0,0	0,0
Mean	0,96	2,02	2,08	12,05	14,72	89,83	22,86	9,60	0,10	0,00	0,34	1,92	301,63	21,34	57,90	1001,83	295,73	0,00
Min	0,10	1,60	1,70	8,60	10,71	26,40	13,10	4,70	0,00	0,00	0,10	0,40	235,00	18,20	46,70	1001,10	0,00	0,00
Max	1,20	2,70	2,60	16,00	18,97	121,70	36,50	14,56	0,30	0,00	1,40	3,70	355,00	26,10	68,10	1002,50	860,20	0,00

Metalli - Giornaliero µg/m³	
Cadmio	0,0015
Cromo	< 0,001
Nichel	0,0019
Manganese	< 0,001
Piombo	0,031
Rame	0,0024

Il Committente
Hi-Pro s.r.l.

ORDINE INGEGNERI PROVINCIA TARANTO
Dott. Ing. DIDONNA Raffaele
n° 2326
Sez. A
Settore:
Civile Ambientale
Industriale
Informazione

Il Tecnico
dott. ing. Raffaele Didonna

Emonitoring s.r.l.
Via L. Einaudi, 97
75100 Matera - (MT)
Tel./Fax 0835 332455

CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 20 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	W\m2	mm/H2O
01:00	1,20	1,50	1,60	9,40	11,50	73,50	13,90	4,53	0,00	0,00	0,10	1,50	292,0	21,1	66,4	1002,4	0,0	0,0
02:00	1,20	1,70	1,80	9,40	11,71	69,30	18,70	6,09	0,00	0,00	0,20	1,70	260,0	21,9	68,8	1002,6	0,0	0,0
03:00	1,20	1,70	1,90	9,60	12,02	64,30	19,70	6,42	0,00	0,00	0,10	0,90	244,0	21,4	68,8	1002,7	0,0	0,0
04:00	1,10	1,70	2,00	9,90	12,44	61,10	21,00	6,84	0,00	0,00	0,20	2,10	228,0	21,0	67,9	1002,8	0,0	0,0
05:00	1,10	1,90	2,20	11,60	14,42	68,10	22,10	7,20	0,00	0,00	0,20	2,30	152,0	20,6	67,0	1002,8	0,0	0,0
06:00	1,10	2,10	2,20	11,70	14,39	75,10	27,20	8,86	0,10	0,00	0,20	3,10	298,0	21,0	66,6	1002,9	10,3	0,0
07:00	1,10	2,50	2,40	15,10	18,12	86,50	27,40	11,30	0,10	0,00	0,30	1,40	245,0	21,1	66,5	1003,3	126,5	0,0
08:00	1,00	2,50	2,70	15,10	18,43	94,40	34,60	14,27	0,10	0,00	0,40	2,20	121,0	21,1	64,2	1003,5	263,8	0,0
09:00	1,00	2,60	2,80	13,30	16,67	99,80	34,50	14,23	0,00	0,00	0,50	0,70	125,0	21,9	57,7	1003,5	501,3	0,0
10:00	1,00	2,70	2,70	11,70	14,91	105,90	29,40	12,12	0,20	0,00	0,70	2,00	194,0	23,8	54,0	1003,8	665,9	0,0
11:00	1,00	2,70	2,40	11,50	14,39	132,20	24,60	10,73	0,10	0,00	0,70	2,50	275,0	24,5	54,0	1003,8	789,6	0,0
12:00	1,00	2,40	2,10	9,90	12,76	133,50	22,40	9,77	0,20	0,00	0,60	2,40	168,0	25,8	53,7	1003,4	884,7	0,0
13:00	0,90	2,30	2,00	9,50	12,23	142,00	21,60	9,42	0,30	0,00	0,70	3,10	176,0	27,0	53,0	1003,2	921,3	0,0
14:00	0,90	2,20	1,70	8,70	11,06	132,40	22,90	9,99	0,20	0,00	0,90	2,70	204,0	29,0	50,4	1003,0	884,1	0,0
15:00	0,90	1,90	2,00	10,80	13,61	106,80	26,60	11,60	0,20	0,00	0,70	2,70	212,0	29,6	50,8	1002,9	813,5	0,0
16:00	0,90	1,70	2,00	14,70	17,76	98,00	27,30	11,91	0,10	0,00	0,70	2,40	222,0	29,2	55,3	1002,8	621,4	0,0
17:00	0,80	1,50	2,10	14,70	17,68	99,20	32,10	14,00	0,10	0,00	0,70	1,90	136,0	27,3	58,8	1002,7	374,5	0,0
18:00	0,80	1,70	2,70	15,00	18,63	101,10	32,40	14,56	0,00	0,00	0,80	0,50	143,0	26,9	60,1	1002,6	325,7	0,0
19:00	0,80	1,70	3,00	15,80	19,78	94,30	34,80	15,64	0,00	0,00	0,50	1,20	144,0	25,9	62,1	1002,7	191,4	0,0
20:00	0,70	1,80	3,10	13,70	17,68	88,80	34,00	15,28	0,00	0,00	0,20	2,60	181,0	25,1	64,7	1003,2	56,3	0,0
21:00	0,70	1,80	3,00	13,30	17,15	84,10	33,70	13,33	0,10	0,00	0,10	1,70	141,0	24,3	64,9	1003,2	13,8	0,0
22:00	0,70	2,20	2,70	9,90	13,12	77,80	33,00	13,06	0,00	0,00	0,10	3,30	166,0	24,1	65,6	1003,4	0,0	0,0
23:00	0,70	1,60	2,40	9,70	12,60	73,50	23,20	10,64	0,00	0,00	0,00	2,60	144,0	23,6	66,3	1003,5	0,0	0,0
00:00	0,70	1,40	2,20	9,20	11,87	67,20	15,60	8,78	0,00	0,00	0,10	2,20	224,0	22,9	67,7	1003,7	0,0	0,0
Mean	0,94	1,99	2,32	11,80	14,79	92,87	26,36	10,86	0,08	0,00	0,40	2,07	195,63	24,17	61,47	1003,10	310,17	0,00
Min	0,70	1,40	1,60	8,70	11,06	61,10	13,90	4,53	0,00	0,00	0,00	0,50	121,00	20,60	50,40	1002,40	0,00	0,00
Max	1,20	2,70	3,10	15,80	19,78	142,00	34,80	15,64	0,30	0,00	0,90	3,30	298,00	29,60	68,80	1003,80	921,30	0,00

Metalli - Giornaliero µg/m³	
Cadmio	0,0018
Cromo	0,0015
Nichel	0,0018
Manganese	0,0025
Piombo	0,034
Rame	0,0029

Il Committente
Hi-Pro s.r.l.

ORDINE INGEGNERI PROVINCIA TARANTO
Dott. Ing. DIDONNA RAFFAELE
n° 2826
Sezione A
Settore: Civile Ambientale Industriale Informazione

Il Tecnico
dott. ing. Raffaele Didonna

Emonitoring s.r.l.
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75100 Matera - (MT)
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CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 21 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	W\m2	mm/H2O
01:00	0,80	1,90	1,40	7,30	9,20	70,30	12,30	2,70	0,00	0,00	0,60	0,50	321,0	17,5	71,3	1003,5	0,0	0,0
02:00	0,80	2,00	1,30	9,20	11,30	66,30	10,50	3,10	0,10	0,00	0,70	0,60	333,0	17,9	75,2	1003,6	0,0	0,0
03:00	0,90	2,10	1,50	10,10	11,70	61,50	12,10	4,60	0,10	0,00	1,80	0,80	332,0	18,1	79,6	1003,8	0,0	0,0
04:00	0,80	2,10	1,50	11,30	13,40	58,40	13,40	5,70	0,10	0,00	3,80	1,70	298,0	18,3	81,3	1003,9	0,0	0,0
05:00	0,70	2,20	1,70	13,50	16,60	65,10	12,30	5,20	0,10	0,00	4,20	1,90	265,0	18,5	81,7	1004,1	0,0	0,0
06:00	0,60	2,30	2,20	18,60	21,80	71,80	15,60	8,90	0,20	0,00	3,00	3,00	268,0	18,6	82,1	1004,2	8,5	0,0
07:00	0,80	2,20	3,40	22,40	26,40	82,70	21,30	12,30	0,30	0,00	0,60	2,70	271,0	19,4	76,9	1004,4	94,2	0,0
08:00	0,80	2,50	3,10	20,10	24,70	90,30	20,30	13,10	0,10	0,00	2,20	1,20	265,0	23,2	70,2	1004,3	261,3	0,0
09:00	0,90	2,30	2,00	12,70	15,30	95,40	21,50	11,50	0,20	0,00	4,10	0,90	264,0	28,7	61,9	1004,1	415,8	0,0
10:00	0,90	2,30	2,30	10,10	13,10	101,30	22,60	11,90	0,30	0,00	2,90	1,30	96,0	29,5	53,7	1003,8	612,3	0,0
11:00	1,30	2,60	2,50	11,30	14,10	126,40	25,40	10,30	0,20	0,00	5,00	0,80	191,0	30,9	37,7	1003,6	753,7	0,0
12:00	1,10	2,90	2,80	12,70	16,20	127,70	27,30	10,10	0,10	0,00	6,70	1,20	203,0	32,4	35,3	1003,4	850,6	0,0
13:00	1,00	3,70	3,20	13,10	17,90	135,80	28,10	10,50	0,10	0,00	3,70	2,00	167,0	33,2	34,6	1003,1	890,8	0,0
14:00	1,00	3,70	2,70	11,20	15,40	126,60	30,20	12,30	0,10	0,00	3,10	2,50	171,0	33,4	37,6	1002,6	944,2	0,0
15:00	1,00	2,60	1,90	7,70	10,60	102,10	34,60	18,60	0,20	0,00	4,30	1,70	303,0	33,7	41,3	1002,3	796,1	0,0
16:00	1,00	2,00	1,90	8,30	11,20	93,70	24,10	14,70	0,20	0,00	6,10	1,10	297,0	32,7	45,3	1002,2	385,7	0,0
17:00	1,00	2,40	1,80	8,00	10,80	94,90	28,30	16,80	0,00	0,00	3,70	1,20	308,0	33,2	43,9	1001,9	350,0	0,0
18:00	1,00	2,20	1,60	7,80	10,30	96,70	21,30	13,40	0,10	0,00	3,70	1,20	314,0	32,2	45,0	1001,7	365,3	0,0
19:00	0,90	2,00	1,60	9,20	11,70	90,20	20,10	13,40	0,00	0,00	4,30	1,40	333,0	29,8	50,7	1001,8	166,2	0,0
20:00	0,90	2,00	1,50	9,30	11,50	84,90	13,10	7,80	0,10	0,00	6,10	1,20	328,0	27,9	56,1	1002,0	33,4	0,0
21:00	0,90	2,30	4,80	14,20	21,40	80,40	17,90	11,30	0,10	0,00	1,20	0,90	305,0	26,7	59,7	1002,4	2,1	0,0
22:00	0,90	2,10	1,60	11,30	13,70	74,40	14,00	10,90	0,10	0,00	6,10	0,60	339,0	25,1	65,6	1003,2	0,0	0,0
23:00	0,90	1,90	1,60	13,00	15,40	70,30	5,90	8,20	0,10	0,00	3,70	1,10	342,0	24,0	70,6	1003,8	0,0	0,0
00:00	0,90	1,70	1,60	12,10	14,60	64,30	9,60	6,70	0,10	0,00	0,70	0,80	340,0	23,1	73,9	1004,0	0,0	0,0
Mean	0,91	2,33	2,15	11,85	14,93	88,81	19,24	10,17	0,13	0,00	3,43	1,35	277,25	26,17	59,63	1003,24	288,76	0,00
Min	0,60	1,70	1,30	7,30	9,20	58,40	5,90	2,70	0,00	0,00	0,60	0,50	96,00	17,50	34,60	1001,70	0,00	0,00
Max	1,30	3,70	4,80	22,40	26,40	135,80	34,60	18,60	0,30	0,00	6,70	3,00	342,00	33,70	82,10	1004,40	944,20	0,00

Metalli - Giornaliero µg/m³	
Cadmio	0,0023
Cromo	< 0,001
Nichel	0,0019
Manganese	0,0023
Piombo	0,028
Rame	< 0,001

Il Committente
Hi-Pro s.r.l.

ORDINE INGEGNERI PROVINCIA TARANTO
Dott. Ing. DIDONNA Raffaele
n° 2326
Sezione A
Civile Ambientale
Industriale
Informazione

Il Tecnico
dott. ing. Raffaele Didonna

Emonitoring s.r.l.
Via L. Einaudi, 97
75100 Matera - (MT)
Tel./Fax 0835 332455

CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 22 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	W\m2	mm/H2O
01:00	0,70	2,10	1,60	8,60	11,10	65,10	5,90	3,30	0,10	0,00	0,70	1,00	342,0	22,1	77,0	1004,0	0,0	0,0
02:00	0,70	2,40	1,60	12,10	14,60	60,80	9,60	3,50	0,20	0,00	1,30	1,00	344,0	21,7	78,3	1004,0	0,0	0,0
03:00	0,80	2,30	1,90	9,70	12,60	51,70	6,10	5,40	0,40	0,00	3,70	0,90	342,0	20,7	79,6	1004,0	0,0	0,0
04:00	0,90	2,00	3,10	12,70	17,40	45,00	11,00	6,00	0,70	0,00	6,10	0,50	353,0	19,4	81,3	1003,9	0,0	0,0
05:00	0,90	2,00	2,40	15,80	19,60	45,50	10,10	4,90	0,10	0,00	3,70	0,50	340,0	19,0	81,7	1003,9	0,0	0,0
06:00	0,90	2,40	2,90	21,30	25,80	44,10	16,60	10,30	0,10	0,00	3,60	1,00	14,0	18,9	82,1	1004,3	9,8	0,0
07:00	0,90	2,50	4,70	26,10	33,40	49,80	24,90	17,00	0,10	0,00	0,70	0,70	349,0	20,6	76,9	1004,7	100,6	0,0
08:00	0,90	2,60	3,20	12,80	17,70	70,30	22,20	14,60	0,20	0,00	4,20	0,70	338,0	24,0	70,2	1004,9	275,8	0,0
09:00	0,90	2,30	2,10	9,10	12,30	77,00	21,60	10,50	0,10	0,00	6,70	0,70	297,0	26,9	61,9	1004,8	434,1	0,0
10:00	0,90	2,30	2,30	10,50	14,10	94,30	22,80	12,30	0,10	0,00	3,10	0,90	270,0	29,2	53,7	1004,7	621,7	0,0
11:00	0,90	3,30	2,50	11,20	15,00	114,80	19,50	11,60	0,00	0,00	1,30	1,00	207,0	31,1	45,4	1004,8	756,1	0,0
12:00	0,90	3,60	2,40	11,30	15,00	125,50	21,50	7,50	0,10	0,00	6,60	1,80	166,0	32,3	39,6	1004,7	851,7	0,0
13:00	0,90	3,00	2,60	11,80	15,70	123,90	29,70	9,00	0,10	0,00	3,70	3,20	174,0	32,7	39,6	1004,7	889,4	0,0
14:00	0,90	3,40	2,40	11,30	15,00	123,80	31,10	7,50	0,10	0,00	3,10	3,30	175,0	32,5	37,7	1004,6	879,9	0,0
15:00	0,90	3,30	2,60	11,30	15,40	120,00	23,50	9,60	0,00	0,00	3,60	3,50	171,0	32,6	35,6	1004,3	822,8	0,0
16:00	0,90	3,40	2,10	9,40	12,60	119,70	25,40	10,80	0,10	0,00	0,70	3,10	174,0	32,6	33,7	1004,2	597,5	0,0
17:00	0,90	2,60	2,00	9,90	13,10	117,80	24,60	7,10	0,00	0,00	3,60	2,70	174,0	32,4	31,7	1004,0	329,0	0,0
18:00	0,90	3,40	3,90	13,50	18,60	121,60	12,60	5,50	0,10	0,00	3,70	2,20	168,0	31,7	34,2	1004,0	318,4	0,0
19:00	1,00	3,30	2,30	19,60	23,20	123,90	12,50	2,20	0,10	0,00	3,70	1,30	178,0	30,9	39,2	1004,0	219,7	0,0
20:00	0,90	3,30	2,00	15,20	18,30	114,20	41,00	15,40	0,10	0,00	4,20	0,50	182,0	29,3	49,6	1004,4	44,7	0,0
21:00	0,90	2,30	2,90	43,00	47,40	63,10	43,10	16,00	0,10	0,00	3,10	calma	n.p.	27,0	54,0	1004,5	0,9	0,0
22:00	0,80	2,50	2,30	25,90	29,40	59,50	28,70	14,00	0,10	0,00	1,30	0,40	349,0	24,1	55,0	1004,8	0,0	0,0
23:00	0,70	2,10	2,00	14,60	17,70	70,10	29,80	12,10	0,10	0,00	3,10	1,10	344,0	23,7	61,8	1005,1	0,0	0,0
00:00	0,60	2,20	2,00	16,20	19,40	74,50	19,90	11,20	0,10	0,00	3,70	1,00	341,0	23,4	61,4	1005,5	0,0	0,0
Mean	0,86	2,69	2,49	15,12	18,93	86,50	21,40	9,47	0,13	0,00	3,30	1,43	251,83	26,62	56,72	1004,45	298,00	0,00
Min	0,60	2,00	1,60	8,60	11,10	44,10	5,90	2,20	0,00	0,00	0,70	0,40	14,00	18,90	31,70	1003,90	0,00	0,00
Max	1,00	3,60	4,70	43,00	47,40	125,50	43,10	17,00	0,70	0,00	6,70	3,50	353,00	32,70	82,10	1005,50	889,40	0,00

Metalli - Giornaliero µg/m³	
Cadmio	0,0031
Cromo	< 0,001
Nichel	0,0024
Manganese	0,0027
Piombo	0,029
Rame	< 0,001

Il Committente
Hi-Pro s.r.l.

ORDINE INGEGNERI PROVINCIA TARANTO
Dott. Ing. DIDONNA Raffaele
n° 2326
Sezione A
Civile Ambientale
Industriale
Informazione

Il Tecnico
dott.ing. Raffaele Didonna

Emonitoring s.r.l.
Via L. Einaudi, 97
75100 Matera - (MT)
Tel./Fax 0835 332455

CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 23 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	Wm2	mm/H2O
01:00	0,70	2,20	2,20	15,60	18,90	65,20	17,80	10,90	0,10	0,00	0,70	0,9	340,0	21,9	63,4	1005,7	0,0	0,0
02:00	0,80	1,50	2,00	14,70	17,80	63,90	20,80	14,10	0,20	0,00	0,70	0,80	343,0	20,8	65,7	1005,8	0,0	0,0
03:00	0,80	2,20	2,00	9,90	12,90	65,70	17,20	6,50	0,10	0,00	1,30	0,60	343,0	19,9	68,0	1005,5	0,0	0,0
04:00	0,80	1,80	2,00	10,50	13,60	67,40	15,90	8,20	0,10	0,00	3,10	0,40	339,0	19,3	70,9	1005,3	0,0	0,0
05:00	0,90	2,50	2,50	18,20	22,10	59,50	13,70	7,50	0,10	0,00	3,70	0,70	336,0	19,0	71,0	1005,2	0,0	0,0
06:00	0,90	2,00	2,90	23,90	28,30	57,30	15,90	9,30	0,10	0,00	0,70	0,80	339,0	18,9	72,5	1005,4	8,5	0,0
07:00	0,90	2,60	7,10	36,30	47,20	42,50	14,60	9,40	0,10	0,00	0,70	calma	n.p.	20,7	69,0	1005,5	102,6	0,0
08:00	1,00	2,40	2,90	13,50	18,00	74,40	23,00	10,40	0,10	0,00	0,70	0,50	316,0	24,1	59,2	1005,5	281,0	0,0
09:00	0,90	2,30	3,30	14,80	19,80	79,20	21,90	11,40	0,00	0,00	0,70	0,80	297,0	26,8	55,3	1005,6	455,5	0,0
10:00	1,00	3,50	2,60	10,30	14,30	94,90	24,80	12,00	0,00	0,00	0,70	1,10	281,0	30,3	48,5	1005,5	628,8	0,0
11:00	1,00	3,40	3,00	9,80	14,50	96,40	20,90	9,90	0,00	0,00	0,70	1,30	286,0	32,7	43,2	1005,7	767,1	0,0
12:00	1,00	3,30	2,20	7,70	11,10	99,20	18,30	7,10	0,10	0,00	3,70	1,20	316,0	34,0	38,6	1005,7	856,3	0,0
13:00	0,90	3,50	2,80	7,00	11,40	104,60	19,30	7,20	0,10	0,00	0,70	1,30	339,0	35,1	31,9	1005,1	895,2	0,0
14:00	0,90	3,00	3,10	9,70	14,40	110,90	25,90	13,50	0,10	0,00	1,20	1,20	261,0	36,0	29,9	1004,5	879,1	0,0
15:00	0,90	2,80	3,90	10,30	16,30	124,30	25,50	15,90	0,10	0,00	3,10	3,60	167,0	34,5	31,4	1004,1	817,7	0,0
16:00	0,90	3,50	3,30	11,10	16,10	115,60	40,80	19,90	0,10	0,00	0,70	3,00	171,0	33,8	30,1	1003,9	571,6	0,0
17:00	0,90	2,70	4,10	20,40	26,70	103,70	42,50	16,50	0,10	0,00	0,70	2,00	178,0	32,6	34,5	1003,6	190,9	0,0
18:00	1,00	3,30	3,30	13,40	18,50	91,50	31,10	11,70	0,10	0,00	0,70	0,70	198,0	31,0	45,6	1003,5	139,5	0,0
19:00	1,00	2,60	2,90	15,80	20,30	77,50	36,80	14,30	0,10	0,00	1,30	0,50	277,0	30,1	54,5	1003,7	99,0	0,0
20:00	1,00	2,40	1,90	9,00	12,00	86,00	39,40	14,60	0,10	0,00	6,70	1,00	300,0	28,3	58,4	1003,8	37,1	0,0
21:00	1,00	2,20	1,80	8,10	10,80	85,30	32,40	15,60	0,10	0,00	3,60	0,90	330,0	27,1	62,2	1003,9	3,5	0,0
22:00	1,00	1,70	1,80	8,00	10,80	83,40	24,70	11,00	0,10	0,00	6,10	0,90	332,0	26,4	64,9	1004,4	0,0	0,0
23:00	0,80	1,80	1,90	9,30	12,20	81,50	15,10	9,80	0,10	0,00	0,70	0,80	286,0	25,7	67,4	1005,0	0,0	0,0
00:00	0,70	1,70	2,10	10,30	13,60	76,30	20,80	13,90	0,10	0,00	4,30	1,00	322,0	25,2	68,7	1005,2	0,0	0,0
Mean	0,90	2,54	2,82	13,23	17,57	83,59	24,13	11,69	0,09	0,00	1,97	1,13	291,17	27,26	54,37	1004,88	280,56	0,00
Min	0,70	1,50	1,80	7,00	10,80	42,50	13,70	6,50	0,00	0,00	0,70	0,40	167,00	18,90	29,90	1003,50	0,00	0,00
Max	1,00	3,50	7,10	36,30	47,20	124,30	42,50	19,90	0,20	0,00	6,70	3,60	343,00	36,00	72,50	1005,80	895,20	0,00

Metalli - Giornaliero µg/m³	
Cadmio	0,0025
Cromo	< 0,001
Nichel	0,0034
Manganese	0,0019
Piombo	0,034
Rame	< 0,001

Il Committente
Hi-Pro s.r.l.

ORDINE INGEGNERI PROVINCIA TARANTO
Dott. Ing. DIDONNA Raffaele
n° 2826
Sezione A
Settore: Civile Ambientale Industriale Informazione

Il Tecnico
dott. ing. Raffaele Didonna

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CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 24 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	W\m2	mm/H2O
01:00	0,60	1,70	2,10	10,40	13,70	78,20	23,80	17,60	0,10	0,00	3,10	0,60	20,0	24,50	70,40	1004,9	0,0	0,00
02:00	0,60	1,70	2,30	16,20	19,80	64,60	19,40	12,60	0,10	0,00	3,60	0,50	352,0	23,20	74,60	1004,8	0,0	0,00
03:00	0,70	1,80	2,30	10,30	14,00	74,20	13,80	8,80	0,10	0,00	0,70	0,90	346,0	22,60	77,30	1004,5	0,0	0,00
04:00	0,80	2,10	2,50	9,10	12,90	77,30	17,20	12,10	0,10	0,00	3,70	1,30	342,0	22,60	76,50	1004,3	0,0	0,00
05:00	0,90	2,00	2,60	10,00	14,10	75,10	15,90	11,00	0,20	0,00	0,70	1,50	342,0	22,20	77,20	1004,3	0,0	0,00
06:00	1,00	1,60	3,60	11,30	16,80	77,40	13,40	9,30	0,10	0,00	0,70	1,30	340,0	22,20	76,40	1004,4	8,6	0,00
07:00	0,90	1,70	2,50	9,40	13,10	78,10	14,60	9,30	0,10	0,00	1,30	0,90	334,0	23,10	74,00	1004,4	94,6	0,00
08:00	1,10	2,00	2,50	9,70	13,60	82,30	15,90	9,60	0,10	0,00	3,10	1,00	334,0	25,20	67,50	1004,4	266,7	0,00
09:00	1,10	2,40	3,60	12,20	17,70	88,40	13,90	11,60	0,10	0,00	0,60	0,80	325,0	28,40	57,80	1004,4	436,8	0,00
10:00	1,10	2,80	2,50	8,40	12,30	97,90	18,30	7,30	0,30	0,00	3,70	1,00	298,0	30,70	51,10	1004,2	606,1	0,00
11:00	1,10	2,60	3,00	9,70	14,40	104,80	18,80	7,50	0,00	0,00	3,70	0,90	284,0	33,10	43,80	1004,0	745,3	0,00
12:00	1,00	3,10	2,30	5,80	9,40	111,90	21,80	9,40	0,10	0,00	1,30	0,80	302,0	34,60	39,40	1003,5	832,4	0,00
13:00	1,00	4,30	2,40	6,10	9,80	113,90	19,20	11,30	0,10	0,00	3,00	1,00	279,0	36,10	36,30	1003,1	889,9	0,00
14:00	1,00	3,70	2,20	6,70	10,10	120,10	25,80	18,70	0,10	0,00	0,70	1,30	334,0	36,80	32,70	1002,6	879,5	0,00
15:00	1,00	4,10	2,30	7,70	11,30	125,90	28,80	20,70	0,00	0,00	1,30	2,90	172,0	37,50	32,50	1002,2	828,5	0,00
16:00	1,00	3,10	2,80	9,80	14,10	134,00	26,50	17,00	0,10	0,00	3,70	3,20	165,0	35,40	36,00	1002,2	585,3	0,00
17:00	1,00	3,00	2,80	14,20	18,50	103,80	33,80	20,40	0,00	0,00	3,10	0,90	121,0	32,80	44,70	1002,0	170,6	0,00
18:00	1,10	4,00	2,90	13,00	17,50	115,50	29,70	13,90	0,10	0,00	3,70	0,60	151,0	34,40	40,20	1001,8	278,5	0,00
19:00	1,00	3,10	2,60	8,30	12,30	91,70	24,50	10,90	0,10	0,00	1,30	1,10	302,0	33,60	43,10	1001,7	188,4	0,00
20:00	1,00	2,50	2,00	8,50	11,60	89,20	18,80	8,20	0,10	0,00	3,10	1,30	329,0	30,40	50,10	1002,0	42,7	0,00
21:00	0,80	3,30	2,00	10,40	13,50	82,00	16,30	8,20	0,00	0,00	1,30	0,80	337,0	28,30	55,60	1002,4	3,3	0,00
22:00	0,70	2,50	2,00	9,50	12,50	81,50	23,10	14,30	0,00	0,00	3,10	1,10	340,0	26,70	59,60	1002,9	0,0	0,00
23:00	0,70	2,30	2,10	10,70	13,90	74,80	22,70	14,80	0,10	0,00	4,20	1,10	345,0	25,70	62,40	1003,1	0,0	0,00
00:00	0,60	2,90	2,20	9,50	12,80	73,60	25,10	18,00	0,00	0,00	3,00	0,90	339,0	24,80	64,00	1003,2	0,0	0,00
Mean	0,91	2,68	2,50	9,87	13,74	92,34	20,88	12,60	0,09	0,00	2,40	1,15	284,71	28,95	55,97	1003,39	285,72	0,00
Min	0,60	1,60	2,00	5,80	9,40	64,60	13,40	7,30	0,00	0,00	0,60	0,50	20,00	22,20	32,50	1001,70	0,00	0,00
Max	1,10	4,30	3,60	16,20	19,80	134,00	33,80	20,70	0,30	0,00	4,20	3,20	352,00	37,50	77,30	1004,90	889,90	0,00

Metalli - Giornaliero µg/m³	
Cadmio	0,0026
Cromo	< 0,001
Nichel	0,0026
Manganese	< 0,001
Piombo	0,036
Rame	0,0013

Il Committente
Hi-Pro s.r.l.

ORDINE INGEGNERI PROVINCIA TARANTO
Dott. Ing. DIDONNA Raffaele
n° 2326
Sezione A
Settore: Civile Ambientale, Industriale, Informazione

Il Tecnico
dott. ing. Raffaele Didonna

Emonitoring s.r.l.
Via L. Einaudi, 97
75100 Matera - (MT)
Tel./Fax 0835 332455

CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 25 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	W\m2	mm/H2O
01:00	0,70	1,90	2,20	9,10	12,50	78,10	23,60	16,10	0,10	0,00	3,60	0,90	341,0	24,30	63,60	1003,0	0,0	0,00
02:00	0,70	2,40	2,20	9,50	12,90	77,40	18,50	14,20	0,00	0,00	0,70	0,80	340,0	24,00	63,70	1002,7	0,0	0,00
03:00	0,80	1,60	2,10	7,50	10,70	78,30	12,70	6,70	0,10	0,00	0,70	1,00	343,0	23,40	67,40	1002,6	0,0	0,00
04:00	0,80	1,80	2,10	7,80	11,00	76,20	10,10	4,20	0,10	0,00	0,70	1,10	343,0	23,10	68,10	1002,2	0,0	0,00
05:00	0,90	2,20	2,30	7,70	11,20	74,40	15,70	10,50	0,00	0,00	0,60	1,20	341,0	22,60	71,30	1002,2	0,0	0,00
06:00	1,00	1,50	2,50	11,70	15,50	64,90	17,80	11,70	0,10	0,00	1,30	1,20	342,0	22,50	72,40	1002,4	8,8	0,00
07:00	1,00	2,30	2,70	11,30	15,50	64,90	14,60	8,40	0,00	0,00	6,10	1,00	342,0	23,30	71,70	1002,4	94,3	0,00
08:00	1,00	1,70	2,40	7,00	10,80	72,90	16,70	9,70	0,10	0,00	0,70	0,50	307,0	26,30	65,70	1002,3	263,9	0,00
09:00	1,10	2,50	2,70	7,60	11,70	78,80	18,80	11,90	0,10	0,00	0,70	0,70	303,0	29,20	57,90	1002,0	434,8	0,00
10:00	1,10	2,20	2,50	6,30	10,20	94,60	15,80	9,40	0,10	0,00	0,70	0,60	292,0	31,80	49,60	1001,7	603,6	0,00
11:00	1,10	3,20	2,60	6,80	10,80	110,80	19,30	10,30	0,10	0,00	0,60	1,20	162,0	34,10	41,10	1001,4	741,1	0,00
12:00	1,10	2,90	4,10	13,30	19,70	119,90	21,00	11,80	0,10	0,00	3,60	1,60	153,0	35,80	35,90	1001,0	842,0	0,00
13:00	1,10	2,40	3,50	10,40	15,80	122,70	33,00	22,60	0,10	0,00	3,70	3,00	167,0	35,50	40,10	1000,6	580,6	0,00
14:00	1,10	2,20	2,70	7,20	11,30	115,40	36,30	23,50	0,10	0,00	0,60	2,40	168,0	32,60	47,00	1000,6	244,3	0,00
15:00	1,10	2,30	2,60	5,90	10,00	119,70	28,80	18,00	0,10	0,00	0,70	2,60	168,0	32,10	48,00	1000,7	598,3	0,00
16:00	1,10	3,00	2,90	8,10	12,50	126,90	25,80	16,80	0,00	0,00	0,60	2,60	167,0	33,20	43,50	1000,4	487,6	0,00
17:00	1,10	2,50	2,80	8,00	12,30	126,80	28,80	19,80	0,00	0,00	1,30	1,90	183,0	34,60	40,50	999,4	324,6	0,00
18:00	1,10	2,60	2,70	8,50	12,70	127,40	25,30	16,30	0,10	0,00	6,10	1,70	171,0	34,10	40,70	999,0	329,9	0,00
19:00	1,10	2,40	2,50	9,30	13,10	107,40	24,10	15,10	0,00	0,00	1,20	1,10	181,0	34,60	38,90	998,6	260,2	0,00
20:00	0,90	2,50	3,10	13,60	18,40	78,50	16,10	7,00	0,10	0,00	6,60	0,80	274,0	31,60	43,80	998,9	53,6	0,00
21:00	1,00	1,10	2,30	8,80	12,30	77,50	15,50	6,20	0,10	0,00	3,70	0,90	296,0	28,40	50,70	999,2	2,5	0,00
22:00	0,90	2,00	2,10	9,50	12,80	79,90	22,40	11,90	0,10	0,00	6,10	0,80	327,0	26,60	56,30	999,8	0,0	0,00
23:00	0,80	1,60	2,10	7,60	10,80	84,10	16,40	9,50	0,10	0,00	3,70	1,20	333,0	25,50	61,00	1000,0	0,0	0,00
00:00	0,70	1,50	2,10	7,20	10,40	81,30	17,20	11,30	0,00	0,00	3,70	1,30	338,0	24,80	60,80	1000,1	0,0	0,00
Mean	0,97	2,18	2,58	8,74	12,70	93,28	20,60	12,62	0,07	0,00	2,42	1,34	265,92	28,92	54,15	1000,97	244,59	0,00
Min	0,70	1,10	2,10	5,90	10,00	64,90	10,10	4,20	0,00	0,00	0,60	0,50	153,00	22,50	35,90	998,60	0,00	0,00
Max	1,10	3,20	4,10	13,60	19,70	127,40	36,30	23,50	0,10	0,00	6,60	3,00	343,00	35,80	72,40	1003,00	842,00	0,00

Metalli - Giornaliero µg/m³	
Cadmio	0,0026
Cromo	< 0,001
Nichel	0,0026
Manganese	0,0032
Piombo	0,036
Rame	0,0018

Il Committente
Hi-Pro s.r.l.

ORDINE INGEGNERI PROVINCIA MATERA
Dott. Ing. DIDONNA n° 2326
Sezione A
Settore: Civile Ambientale Industriale Informazione

Il Tecnico
dott. ing. Raffaele Didonna

Emonitoring s.r.l.
Via L. Einaudi, 97
75100 Matera - (MT)
Tel./Fax 0835 332455

CAMPAGNA DI MONITORAGGIO DELLA QUALITA' DELL'ARIA
ai sensi del D.Lgs. n. 155/2010

Punto di Campionamento:
ATM_02
Svincolo di Firmo

Data : 26 giugno 2017

Time	CO	SO2	NO	NO2	NOX	O3	PM10	PM2,5	Benzene	Toluene	Xileni	VV	DV	TEMP E	UR E	PRESS	IRRAG	PIOGGIA
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	m\s	°N	°C	%	mbar	W\m2	mm/H2O
01:00	0,60	0,90	2,10	7,30	10,50	81,10	16,30	11,30	0,00	0,00	0,70	1,30	341,0	24,1	61,6	1000,1	0,0	0,0
02:00	6,00	1,00	2,20	8,40	11,70	83,80	15,30	10,20	0,10	0,00	3,70	1,00	338,0	24,0	60,5	999,9	0,0	0,0
03:00	0,70	1,50	2,20	7,30	10,60	86,10	9,00	3,90	0,00	0,00	0,70	1,20	344,0	23,3	63,4	999,8	0,0	0,0
04:00	0,80	1,10	4,30	13,20	19,80	79,30	13,40	8,30	0,00	0,00	0,70	1,10	349,0	22,8	63,7	999,6	0,0	0,0
05:00	0,90	1,50	4,30	32,90	39,50	45,40	14,70	8,70	0,00	0,00	3,70	0,50	16,0	21,4	65,7	999,4	0,0	0,0
06:00	1,00	1,60	5,30	34,30	42,50	45,50	17,30	10,80	0,10	0,00	0,70	0,60	7,0	20,9	73,1	999,4	10,8	0,0
07:00	1,10	1,40	6,10	33,60	43,00	54,40	18,40	7,80	0,10	0,00	0,70	0,50	348,0	23,3	66,4	999,8	95,2	0,0
08:00	1,10	2,20	4,50	18,20	25,10	69,40	24,40	10,80	0,10	0,00	0,70	0,70	331,0	25,7	59,5	1000,1	259,9	0,0
09:00	1,10	1,80	3,50	13,80	19,20	83,80	19,60	8,20	0,00	0,00	0,70	0,80	333,0	28,5	52,8	1000,1	427,4	0,0
10:00																		
11:00																		
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18:00																		
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21:00																		
22:00																		
23:00																		
00:00																		
Mean	1,48	1,44	3,83	18,78	24,66	69,87	16,49	8,89	0,04	0,00	1,37	0,86	267,44	23,78	62,97	999,80	88,14	0,00
Min	0,60	0,90	2,10	7,30	10,50	45,40	9,00	3,90	0,00	0,00	0,70	0,50	7,00	20,90	52,80	999,40	0,00	0,00
Max	6,00	2,20	6,10	34,30	43,00	86,10	24,40	11,30	0,10	0,00	3,70	1,30	349,00	28,50	73,10	1000,10	427,40	0,00

Metalli - Giornaliero µg/m³	
Cadmio	-
Cromo	-
Nichel	-
Manganese	-
Piombo	-
Rame	-

Il Committente
Hi-Pro s.r.l.

ORDINE INGEGNERI PROVINCIA TARANTO
Sezione A
Dott. Ing. DIDONNA Raffaele
n° 2326
Settore:
Civile Ambientale
Industriale
Informazione

Il Tecnico
dott. ing. Raffaele Didonna

Umwelt Bundesamt

TÜVRheinland®
Precisely Right.

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000040217

Certified AMS:	Model 42i for NO, NO_2 and NO_x
Manufacturer:	Thermo Fisher Scientific 27 Forge Parkway Franklin, MA 02038 USA
Test Institute:	TÜV Rheinland Energie und Umwelt GmbH

This is to certify that the AMS has been tested and found to comply with:

VDI 4202-1: 2002, VDI 4203-2: 2004, EN 14211: 2012, EN 15267-1: 2009, EN 15267-2: 2009

Certification is awarded in respect of the conditions stated in this certificate (see also the following pages).

TÜVRheinland®
CERTIFIED

Suitability Tested
Complying with
2008/50/EC
EN 15267
Regular
Surveillance

www.tuv.com
ID 0000040217

Publication in the German Federal Gazette (BAnz.) of 08 April 2006

This certificate will expire on:
31 March 2019

German Federal Environment Agency
Dessau, 29 April 2014

i. A. Dr. Marcel Langner

TÜV Rheinland Energie und Umwelt GmbH
Cologne, 28 April 2014

ppa. Dr. Peter Wilbring

www.umwelt-tuv.de / www.eco-tuv.com teu@umwelt-tuv.de Tel. +49 221 806-5200	TÜV Rheinland Energie und Umwelt GmbH Am Grauen Stein 51105 Cologne
Accreditation according to EN ISO/IEC 17025 and certified according to ISO 9001:2008.	

Umwelt Bundesamt

Certificate:
0000040217 / 29 April 2014

TÜVRheinland®
Precisely Right.

Test report:	936/21203248/C1 of 05 January 2006 Addendum 936/21221382/B of 21 September 2013
Initial certification:	01 April 2014
Date of expiry:	31 March 2019
Publication:	BAnz AT 01 April 2014 B12, chapter VI, notification 22

Approved application
The certified AMS is suitable for continuous monitoring of NO, NO_2 and NO_x in ambient air (stationary operation).

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a three-month field test.

The AMS is approved for a temperature range of 0 °C to +30 °C.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for ambient air applications at which it will be installed.

Basis of the certification
This certification is based on:

- test report 936/21203248/C1 of 05 January 2006 of TÜV Rheinland Immissionsschutz und Energiesysteme GmbH and Addendum 936/21221382/B of 21 September 2013 of TÜV Rheinland Energie und Umwelt GmbH
- suitability announced by the German Federal Environment Agency (UBA) as the relevant body
- the on-going surveillance of the product and the manufacturing process
- publication in the German Federal Gazette (BAnz. 08 April 2006, No. 70, p. 2653, chapter IV, No. 4.1, UBA publication from 21 February 2006)
- publication in the German Federal Gazette (BAnz. 20 April 2007, No. 75, p. 4139, chapter IV, notification 1 and 6, UBA publication from 12 April 2007)
- publication in the German Federal Gazette (BAnz. 03 September 2008, No. 133, p. 3243, chapter IV, notification 12, UBA publication from 12 August 2008)
- publication in the German Federal Gazette (BAnz. 25 August 2009, No. 125, p. 2929, chapter III, notification 16, UBA publication from 03 August 2009)
- publication in the German Federal Gazette (BAnz. 28 July 2010, No. 111, p. 2597, chapter III, notification 4, UBA publication from 12 July 2010)
- publication in the German Federal Gazette (BAnz AT 20 July 2012 B11, chapter IV, notification 23, UBA publication from 06 July 2012)
- publication in the German Federal Gazette (BAnz AT 01 April 2014 B12, chapter VI, notification 22 UBA publication from 27 February 2014)

Umwelt Bundesamt

Certificate:
0000040217 / 29 April 2014

TÜVRheinland®
Precisely Right.

AMS designation:
Analyzer Model 42i

Manufacturer:
Thermo Electron Corporation Franklin, MA 02038 USA and 91056 Erlangen

Field of application:
For continuous monitoring of NO, NO_2 und NO_x in ambient air (stationary operation).

Measuring ranges during the performance test:

NO_2	0 - 400 µg/m³
	0 - 500 µg/m³
NO	0 - 1200 µg/m³

Software:
Version: 01.03.00.094

Testing institute:
TÜV Immissionsschutz und Energiesysteme GmbH, Cologne,
TÜV Rheinland Group

Test report:
Report No.: 936/21203248/C of 5 January 2006

1 Notification of the German Federal Environment Agency

The new name of Thermo Electron Corp., Franklin, USA is Thermo Fisher Scientific, Franklin, USA.

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme, 51101 Cologne, Germany, Dr. Peter Wilbring, dated 20th Dezember 2006

6 Notification of announcements by the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2653) and 12th September 2006 (BAnz. p. 6715)

The measuring systems model 42i for nitrogen oxide, model 43i for sulphur dioxide, model 48i for carbon monoxide and model 49i for ozone, manufactured by Thermo Fisher Scientific, MA 02038, USA, are also manufactured and sold identically and to the same standards by MLU-Monitoring für Leben und Umwelt Ges.m.b.H., Mödling, Austria.

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme, 51101 Cologne, Germany, Dr. Peter Wilbring, dated 14th December 2006

12 Notification of announcement by the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2655)

The current software version of the ambient air measuring system 42i by Thermo Fisher Scientific is:

V 01.05.01 (105646-00)

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme dated 10th March 2008

16 Notification of announcement by the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2655)

The current software version of the ambient air measuring system 42i by Thermo Fisher Scientific is:

V 01.06.01 (108456-00)

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 1st April 2009

4 Notification of announcements by the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2655) and 3rd August 2009 (BAnz. p. 2936)

The current software version of the ambient air measuring system 42i by Thermo Fisher Scientific is:

V 01.06.02 (108957-00)

The ambient air measuring system 42i by Thermo Fisher Scientific can now also be operated with a sample gas pump of type PU1961-N811-3.07 manufactured by KNF.

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 23rd March 2010

23 Notification of announcements by the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2653, Chapter IV Number 4.1) and 12th July 2010 (BAnz. p. 2597, Chapter III 4th notification)

The operational voltage of the cooler for the photomultiplier in the ambient air measuring system 42i for NO_x by Thermo Fisher Scientific was changed from 15 V to 13 V to extend the lifecycle of the component.

Statement by TÜV Rheinland Energie und Umwelt GmbH dated 20th March 2012

22 Notification of announcements by the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2653, Chapter IV Number 4.1) and 6th July 2012 (BAnz AT 20.07.2012 B11, Chapter IV, 23rd notification).

The measuring system model 42i for NO, NO_2 and NO_x by Thermo Fisher Scientific fulfils the requirements of EN 14211 (November 2012). Furthermore, the manufacturing process and the quality management system of the measuring system model 42i for NO, NO_2, and NO_x fulfill the requirements of EN 15267.

The test report of the performance test with report number 936/21203248/C1 as well as an addendum as an integral part of to the test report with report number 936/21221382/B can be viewed on the internet at www.qal1.de.

The positioning of the permeation dryer before the ozone generator was changed within the measuring system.

The Arcturus Bd. 101491-xx processor board was withdrawn and replaced by the new Arcturus Bd. 110570-xx processor board.

The current software version of the measuring system is:

V 02.00.05 (113760-00)

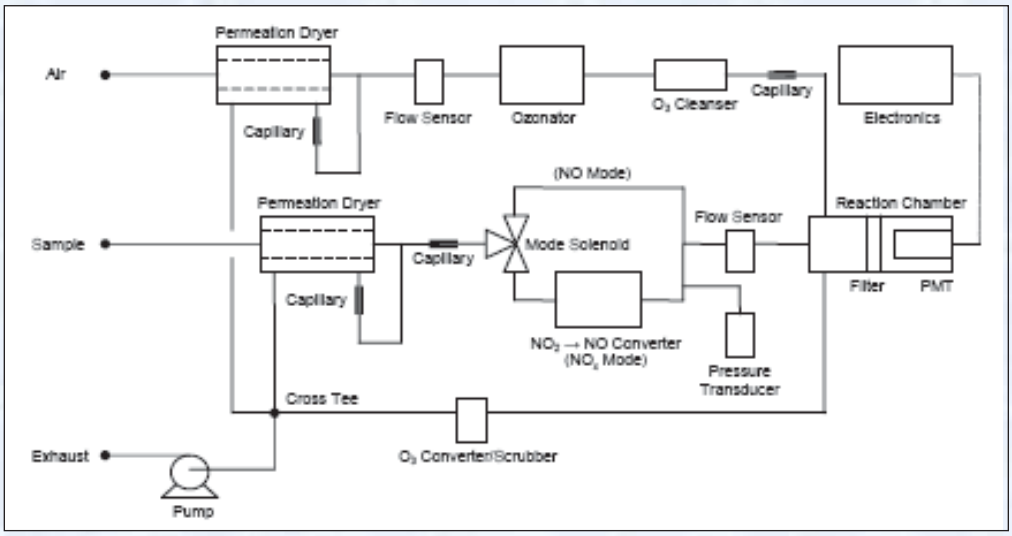
Statement by TÜV Rheinland Energie und Umwelt GmbH dated 1st October 2013

Certified product
This certificate applies to automated measurement systems conforming to the following description:

The measuring system model 42i works according to the principle that nitrogen oxide (NO) and ozone (O_3) react under a characteristic luminescence. The intensity s thereby proportional to NO concentration.

$$NO + O_3 \rightarrow NO_2 + O_2 + h\nu$$

The sample gas passes through a particle filter and a permeation dryer and then flows via a flow regulator and converter into the reaction chamber. The converter converts the nitrogen dioxide present in the sample gas into nitrogen monoxide at 325 °C. To do so ozone is needed, which is produced from dry air in an ozone generator. This is performed using UV radiation. A proportion of NO equivalent to the ozone concentration is oxidised to create NO_2, so called gas phase titration. A detector (PMT) which is located in a thermoelectric cooler measures the luminescence. The model 42i then calculates the NO, NO_2 and NO_x concentration.



The measuring principle complies with the standard reference method as stipulated in EN 14211.

General notes

This certificate is based upon the equipment tested. The manufacturer is responsible for ensuring that on-going production complies with the requirements of the EN 15267. The manufacturer is required to maintain an approved quality management system controlling the manufacture of the certified product. Both the product and the quality management systems shall be subject to regular surveillance.

If a product of the current production does not conform to the certified product, TÜV Rheinland Energie und Umwelt GmbH must be notified at the address given on page 1.

A certification mark with an ID-Number that is specific to the certified product is presented on page 1 of this certificate. This can be applied to the product or used in publicity material for the certified product is presented on page 1 of this certificate.

This document as well as the certification mark remains property of TÜV Rheinland Energie und Umwelt GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energie und Umwelt GmbH this document shall be returned and the certificate mark must not be employed anymore.

The relevant version of this certificate and the validity is also accessible on the internet: **qal1.de**.

Certification of Model 42i for NO, NO_2 and NO_x is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Initial test:

Test report: 936/21203248/C1 of 05 January 2006
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne

Publication: BAnz. 08 April 2006, No. 70, p. 2653, chapter IV, No. 4.1
Announcement by UBA from 21 February 2006

Initial certification according to EN 15267:

Certificate No. 0000040217: 29 April 2014

Expiration date of the certificate: 31 March 2019

Test report: 936/21203248/C1 of 05 January 2006
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne

Addendum 936/21221382/B of 21 September 2013
TÜV Rheinland Energie und Umwelt GmbH, Cologne

Publication: BAnz AT 01 April 2014 B12, chapter VI, notification 22
Announcement by UBA from 27 February 2014

Notification:

Publication: BAnz. 20 April 2007, No. 75, p. 4139, chapter IV, notification 1 and 6
Announcement by UBA from 12 April 2007

Publication: BAnz. 03 September 2008, No. 133, p. 3243, chapter IV, notification 12
Announcement by UBA from 12 August 2008

Publication: BAnz. 25 August 2009, No. 125, p. 2929, chapter III, notification 16
Announcement by UBA from 03 August 2009

Publication: BAnz. 28 July 2010, No. 111, p. 2597, chapter III, notification 4
Announcement by UBA from 12 July 2010

Publication: BAnz AT 20 July 2012 B11, chapter IV, notification 23
Announcement by UBA from 06 July 2012

Publication: BAnz AT 01 April 2014 B12, chapter VI, notification 22
Announcement by UBA from 27 February 2014

qal1.de
info@qal1.de

Calculation of overall uncertainty lab test (Device 1)

Measuring device:	Thermo Fisher Scientific	Serial-No.:	Device 1	
Measured component:	Modell 42i	1h-limit value:	104.6	nmol/mol

No.	Performance characteristic	Performance criterion	Result	Partial uncertainty		Square of partial uncertainty
1	Repeatability standard deviation at zero	≤ 1.0 nmol/mol	0.330	$u_{r,z}$	0.10	0.0097
2	Repeatability standard deviation at 1h-limit value	≤ 3.0 nmol/mol	0.860	$u_{r,lh}$	0.05	0.0028
3	"lack of fit" at 1h-limit value	≤ 4.0% of measured value	-0.400	$u_{l,lh}$	-0.24	0.0584
4	Sensitivity coefficient of sample gas pressure at 1h-limit value	≤ 8.0 nmol/mol/kPa	1.580	u_{gp}	3.98	15.8064
5	Sensitivity coefficient of sample gas temperature at 1h-limit value	≤ 3.0 nmol/mol/K	-0.310	u_{gt}	-0.90	0.8075
6	Sensitivity coefficient of surrounding temperature at 1h-limit value	≤ 3.0 nmol/mol/K	0.390	u_{st}	1.13	1.2781
7	Sensitivity coefficient of electrical voltage at 1h-limit value	≤ 0.30 nmol/mol/V	0.040	u_V	0.16	0.0264
8a	Interferent H_20 with 21 mmol/mol	≤ 10 nmol/mol (Zero)	0.830	u_{H2O}	0.35	0.1258
		≤ 10 nmol/mol (Span)	-1.340			
8b	Interferent CO_2 with 500 µmol/mol	≤ 5.0 nmol/mol (Zero)	-0.100	$u_{int,pos}$	0.38	0.1458
		≤ 5.0 nmol/mol (Span)	-2.330	or		
8c	Interferent NH_3 mit 200 nmol/mol	≤ 5.0 nmol/mol (Zero)	-0.040			
		≤ 5.0 nmol/mol (Span)	-1.000	$u_{int,neg}$		
9	Averaging effect	≤ 7.0% of measured value	-2.680	u_{av}	-1.62	2.6195
18	Difference sample/calibration port	≤ 1.0%	0.000	$u_{\Delta sc}$	0.00	0.0000
21	Converter efficiency	≥ 98	98.00	u_{EC}	2.09	4.3765
23	Uncertainty of test gas	≤ 3.0%	2.000	u_{cg}	1.05	1.0941

Combined standard uncertainty	u_c	5.1345	nmol/mol
Expanded uncertainty	U	10.2691	nmol/mol
Relative expanded uncertainty	W	9.82	%
Maximum allowed expanded uncertainty	W_{req}	15	%

Umwelt Bundesamt

Certificate:
0000040217 / 29 April 2014

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Calculation of overall uncertainty lab test (Device 2)

Measuring device:	Thermo Fisher Scientific		Serial-No.:	Device 2	
Measured component:	Modell 42i		1h-limit value:	104.6	nmol/mol

No.	Performance characteristic	Performance criterion	Result	Partial uncertainty		Square of partial uncertainty
1	Repeatability standard deviation at zero	≤ 1.0 nmol/mol	0.250	$u_{r,z}$	0.07	0.0056
2	Repeatability standard deviation at 1h-limit value	≤ 3.0 nmol/mol	0.360	$u_{r,lh}$	0.02	0.0005
3	"lack of fit" at 1h-limit value	≤ 4.0% of measured value	0.500	$u_{l,lh}$	0.30	0.0912
4	Sensitivity coefficient of sample gas pressure at 1h-limit value	≤ 8.0 nmol/mol/kPa	1.460	u_{gp}	3.67	13.4966
5	Sensitivity coefficient of sample gas temperature at 1h-limit value	≤ 3.0 nmol/mol/K	-0.300	u_{gt}	-0.87	0.7563
6	Sensitivity coefficient of surrounding temperature at 1h-limit value	≤ 3.0 nmol/mol/K	0.370	u_{st}	1.07	1.1503
7	Sensitivity coefficient of electrical voltage at 1h-limit value	≤ 0.30 nmol/mol/V	0.040	u_V	0.16	0.0264
8a	Interferent H_20 with 21 mmol/mol	≤ 10 nmol/mol (Zero)	0.000	u_{H2O}	0.42	0.1773
		≤ 10 nmol/mol (Span)	0.000			
8b	Interferent CO_2 with 500 µmol/mol	≤ 5.0 nmol/mol (Zero)	-0.100	$u_{int,pos}$	0.27	0.0705
		≤ 5.0 nmol/mol (Span)	-1.660	or		
8c	Interferent NH_3 mit 200 nmol/mol	≤ 5.0 nmol/mol (Zero)	0.070			
		≤ 5.0 nmol/mol (Span)	-1.000	$u_{int,neg}$		
9	Averaging effect	≤ 7.0% of measured value	-1.100	u_{av}	-0.66	0.4413
18	Difference sample/calibration port	≤ 1.0%	0.000	$u_{\Delta sc}$	0.00	0.0000
21	Converter efficiency	≥ 98	98.00	u_{EC}	2.09	4.3765
23	Uncertainty of test gas	≤ 3.0%	2.000	u_{cg}	1.05	1.0941

Combined standard uncertainty	u_c	4.6575	nmol/mol
Expanded uncertainty	U	9.3151	nmol/mol
Relative expanded uncertainty	W	8.91	%
Maximum allowed expanded uncertainty	W_{req}	15	%

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Certificate:
0000040217 / 29 April 2014

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Certificate:
0000040217 / 29 April 2014

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Calculation of overall uncertainty lab and field test (Device 1)

Measuring device:	Thermo Fisher Scientific			Serial-No.:	Device 1	
Measured component:	Modell 42i			1h-limit value:	104.6	nmol/mol

No.	Performance characteristic	Performance criterion		Result	Partial uncertainty		Square of partial uncertainty	
1	Repeatability standard deviation at zero	≤	1.0 nmol/mol	0.330	$u_{r,z}$	0.10	0.0097	
2	Repeatability standard deviation at 1h-limit value	≤	3.0 nmol/mol	0.860	$u_{r,lh}$	not considered, as $\sqrt{2}$*ur,lh = 0.07 < ur,f	-	
3	"lack of fit" at 1h-limit value	≤	4.0% of measured value	-0.400	$u_{l,lh}$	-0.24	0.0584	
4	Sensitivity coefficient of sample gas pressure at 1h-limit value	≤	8.0 nmol/mol/kPa	1.580	u_{gp}	3.98	15.8064	
5	Sensitivity coefficient of sample gas temperature at 1h-limit value	≤	3.0 nmol/mol/K	-0.310	u_{gt}	-0.90	0.8075	
6	Sensitivity coefficient of surrounding temperature at 1h-limit value	≤	3.0 nmol/mol/K	0.390	u_{st}	1.13	1.2781	
7	Sensitivity coefficient of electrical voltage at 1h-limit value	≤	0.30 nmol/mol/V	0.040	u_V	0.16	0.0264	
8a	Interferent H_20 with 21 mmol/mol	≤	10 nmol/mol (Zero)	0.830	u_{H2O}	0.35	0.1258	
		≤	10 nmol/mol (Span)	-1.340				
8b	Interferent CO_2 with 500 µmol/mol	≤	5.0 nmol/mol (Zero)	-0.100	$u_{int,pos}$ or $u_{int,neg}$	0.38	0.1458	
		≤	5.0 nmol/mol (Span)	-2.330				
8c	Interferent NH_3 mit 200 nmol/mol	≤	5.0 nmol/mol (Zero)	-0.040				
		≤	5.0 nmol/mol (Span)	-1.000				
9	Averaging effect	≤	7.0% of measured value	-2.680	u_{av}	-1.62	2.6195	
10	Reproducibility standard deviation under field conditions	≤	5.0% of average over 3 months	3.850	$u_{r,f}$	4.03	16.2175	
11	Long term drift at zero level	≤	5.0 nmol/mol	-0.640	$u_{d,l,z}$	-0.37	0.1365	
12	Long term drift at span level	≤	5.0% of max. of certification range	5.000	$u_{d,l,lh}$	3.02	9.1176	
18	Difference sample/calibration port	≤	1.0%	0.000	$u_{\Delta sc}$	0.00	0.0000	
21	Converter efficiency	≥	98	98.000	u_{EC}	2.09	4.3765	
23	Uncertainty of test gas	≤	3.0%	2.000	u_{cg}	1.05	1.0941	

Combined standard uncertainty	u_c	7.1993	nmol/mol
Expanded uncertainty	U	14.3986	nmol/mol
Relative expanded uncertainty	W	13.77	%
Maximum allowed expanded uncertainty	W_{req}	15	%

Calculation of overall uncertainty lab and field test (Device 2)

Measuring device:	Thermo Fisher Scientific			Serial-No.:	Device 2	
Measured component:	Modell 42i			1h-limit value:	104.6	nmol/mol

No.	Performance characteristic	Performance criterion		Result	Partial uncertainty		Square of partial uncertainty
1	Repeatability standard deviation at zero	≤	1.0 nmol/mol	0.250	$u_{r,z}$	0.07	0.0056
2	Repeatability standard deviation at 1h-limit value	≤	3.0 nmol/mol	0.360	$u_{r,lh}$	not considered, as $\sqrt{2}$*ur,lh = 0.03 < ur,f	-
3	"lack of fit" at 1h-limit value	≤	4.0% of measured value	0.500	$u_{l,lh}$	0.30	0.0912
4	Sensitivity coefficient of sample gas pressure at 1h-limit value	≤	8.0 nmol/mol/kPa	1.460	u_{gp}	3.67	13.4966
5	Sensitivity coefficient of sample gas temperature at 1h-limit value	≤	3.0 nmol/mol/K	-0.300	u_{gt}	-0.87	0.7563
6	Sensitivity coefficient of surrounding temperature at 1h-limit value	≤	3.0 nmol/mol/K	0.370	u_{st}	1.07	1.1503
7	Sensitivity coefficient of electrical voltage at 1h-limit value	≤	0.30 nmol/mol/V	0.040	u_V	0.16	0.0264
8a	Interferent H_20 with 21 mmol/mol	≤	10 nmol/mol (Zero)	0.870	u_{H2O}	0.42	0.1773
		≤	10 nmol/mol (Span)	-1.000			
8b	Interferent CO_2 with 500 µmol/mol	≤	5.0 nmol/mol (Zero)	-0.100	$u_{int,pos}$	0.27	0.0705
		≤	5.0 nmol/mol (Span)	-1.660	or		
8c	Interferent NH_3 mit 200 nmol/mol	≤	5.0 nmol/mol (Zero)	0.070			
		≤	5.0 nmol/mol (Span)	-1.000	$u_{int,neg}$		
9	Averaging effect	≤	7.0% of measured value	-1.100	u_{av}	-0.66	0.4413
10	Reproducibility standard deviation under field conditions	≤	5.0% of average over 3 months	3.850	$u_{r,f}$	4.03	16.2175
11	Long term drift at zero level	≤	5.0 nmol/mol	1.140	$u_{d,l,z}$	0.66	0.4332
12	Long term drift at span level	≤	5.0% of max. of certification range	5.000	$u_{d,l,lh}$	3.02	9.1176
18	Difference sample/calibration port	≤	1.0%	0.000	$u_{\Delta sc}$	0.00	0.0000
21	Converter efficiency	≥	98	98.000	u_{EC}	2.09	4.3765
23	Uncertainty of test gas	≤	3.0%	2.000	u_{cg}	1.05	1.0941

Combined standard uncertainty	u_c	6.8891	nmol/mol
Expanded uncertainty	U	13.7782	nmol/mol
Relative expanded uncertainty	W	13.17	%
Maximum allowed expanded uncertainty	W_{req}	15	%

Umwelt Bundesamt

Certificate:
0000040217 / 29 April 2014

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info@qal1.de

Thermo Scientific Model 42*i* NO-NO_2-NO_x Analyzer

Chemiluminsescent gas analyzer

The Thermo Scientific™ Model 42*i* NO-NO_2-NO_x Analyzer utilizes chemiluminescence technology to measure the amount of nitrogen oxides in the air from sub-ppb levels up to 100ppm.

- Ethernet connectivity for efficient remote access
- Enhanced user interface with one button programming and large display screen
- Flash memory for increased data storage and user downloadable software
- Enhanced electronics design optimizes product commonality

The Thermo Scientific Model 42*i* analyzer is a single chamber, single photomultiplier tube design that cycles between the NO and NO_x modes.

The 42*i* analyzer has independent outputs for NO, NO_2, and NO_x, and each can be calibrated separately. Dual range and auto range are standards features as well. If required, the instrument can be operated continuously in either the NO or NO_x modes allowing for response times of less than five seconds.

Temperature and pressure correction are standard features. User settable alarm levels for concentration and for a wide variety of internal diagnostics are available from an easy to follow menu structure.

This state-of-the-art gas analyzer offers features such as an Ethernet port as well as flash memory for increased data storage.

Ethernet connectivity provides efficient remote access, allowing the user to download measurement information directly from the instrument without having to be on-site.

Easily programmable short cut keys allow you to jump directly to frequently accessed functions, menus or screens. The larger interface screen can display up to five lines of measurement information while the primary screen remains visible.

Thermo Scientific Model 42i NO-NO_2-NO_x Analyzer

Thermo Scientific Model 42*i* NO-NO_2-NO_x Analyzer

Preset Ranges	0-0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50 and 100 ppm; 0-0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50, 100 and 150 mg/m3
Custom Ranges	0-0.05 to 100 ppm; 0-0.1 to 150 mg/m3
Zero Noise	0.20 ppb RMS (60 second averaging time)
Lower Detectable Limit	0.40 ppb (60 second averaging time)
Zero Drift (24 hour)	< 0.40 ppb
Span Drift (24 hour)	+/- 0.5% full scale
Response Time	40 seconds (10 second average time) 80 seconds (60 second average time) 300 seconds (300 second average time)
Precision	+/-0.4 ppb (500 ppb range)
Linearity	+/-1% full scale
Sample Flow Rate	0.6 liters/min.
Operating Temperature	59°-95°F (15°- 35°C), safely operated 32°-113° F (0°-45° C)
Power Requirements	100 VAC, 115 VAC, 220-240 VAC +/-10% @ 300W
Size and Weight	16.75"(W) x 8.62"(H) x 23"(D), 55 lbs. (25 kg)
Outputs	Selectable voltage, RS232/RS485, TCP/IP, 10 status relays, and power fail indication (standard). 0-20 or 4-20 mA isolated current output (optional)
Inputs	16 Digital Inputs (standard), 8 0-10 Vdc Analog Inputs (optional)
Approvals and Certifications	U.S. EPA Reference Method: RFNA-1289-074; MCerts Certified: MC070093/00; EN14211: 936/21203248/C Report; NF Certificate: 05/01

Ordering Information

Model 42*i* NO-NO_2-NO_x Analyzer
Choose from the following configurations/options to customize your own Model 42*i* analyzer

1. Voltage options:
A = 120 VAC 50/60 Hz (standard)
B = 220 VAC 50/60 Hz
J = 100 VAC 50/60 Hz

2. Internal zero / span:
N = No zero / span assembly (standard)
Z = Internal zero span assembly
P = Internal permeation span source with zero/ span assembly

3. Converter options:
M = Molybdenum (standard)
S = Stainless steel

4. Sample handling:
S = Standard plumbing (standard)
A = Ammonia scrubber
L = Lag Volume
C = Lag Volume and Ammonia Scrubber
T = Standard Plumbing with Sample Permeation Dryer
V = Lag Volume with Sample Permeation Dryer

5. Ozone handling:
D = Drierite scrubber (standard)
P = Permeation dryer

6. Optional I/O:
A = None (standard)
C = I/O expansion board
(4-20mA outputs - 6 channels,
0-10v inputs - 8 channels)

7. Mounting Hardware:
A = Bench mounting and Ears/Handles, EIA

Your Order Code: 42i - _ _ _ _ _ _ _

To maintain optimal product performance, you need immediate access to experts worldwide, as well as priority status when your air quality equipment needs repair or replacement. We offer comprehensive, flexible support solutions for all phases of the product life cycle. Through predictable, fixed-cost pricing, our services help protect the return on investment and total cost of ownership of your Thermo Scientific products.

For more information, visit our website at thermoscientific.com

This product is manufactured in a plant whose quality management system is ISO 9001 certified.

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Umwelt Bundesamt

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CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000034863_02

Certified AMS:	Gaschromatograph GC 5000 BTX Version PID for Benzene
Manufacturer:	AMA Instruments GmbH Lise-Meitner-Strasse 8 89081 Ulm Germany
Test Institute:	TÜV Rheinland Energy GmbH

This is to certify that the AMS has been tested and certified according to the standards

EN 14662-3 (2005)
EN 15267-1 (2009) and EN 15267-2 (2009).

Certification is awarded in respect of the conditions stated in this certificate (this certificate contains 9 pages).

TÜVRheinland® CERTIFIED

Suitability Tested
Complying with
2008/50/EC
EN 15267
Regular
Surveillance

www.tuv.com
ID 0000034863

Publication in the German Federal Gazette (BAnz.) of 26 January 2011

This certificate will expire on:
01 March 2022

German Federal Environment Agency
Dessau, 28 February 2017

TÜV Rheinland Energy GmbH
Cologne, 27 February 2017

Dr. Marcel Langner
Head of Section II 4.1

ppa. Dr. Peter Wilbring

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TÜV Rheinland Energy GmbH
Am Grauen Stein
51105 Köln

Test institute accredited to EN ISO/IEC 17025:2005 by DAkkS (German Accreditation Body).
This accreditation is limited to the accreditation scope defined in the enclosure to the certificate D-PL-11120-02-00

10/221 2.08

Test report:	LUBW report 143-04R / 10 of 23 November 2010
Initial certification:	02 March 2012
Expiry date:	01 March 2022
Certificate	renewal (previous certificate 0000034863_01 dated from 25 April 2016 with validity up to the 01 March 2017)
Publication:	BAnz. 26 January 2011, No. 14, page 294, chapter III, No. 1.1

Approved application
The tested AMS is suitable for continuous ambient air monitoring of Benzene (stationary operation).

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a more than three months field test at a traffic related location.

The AMS is approved for an ambient temperature range of +5 °C to +35 °C.

The notification of suitability of the AMS, performance testing, and the uncertainty calculation have been effected on the basis of the regulations valid at the time of performance testing. As changes in legal regulations are possible, any potential user should ensure in consultation with the manufacturer that this AMS is suitable for monitoring the limit value relevant to the application.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for ambient air applications at which it will be installed.

Basis of the certification
This certification is based on:

- Test report LUBW report 143-04R / 10 of 23 November 2010 of Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg (LUBW), Karlsruhe
- Suitability announced by the German Federal Environment Agency (UBA) as the relevant body
- The ongoing surveillance of the product and the manufacturing process

Publication in the German Federal Gazette: BAnz 26 January 2011, No. 14, page 294, chapter III number 1.1, Announcement by UBA from 10 January 2011:

AMS designation:
Gaschromatograph GC 5000 BTX Ausführung PID for Benzene

Manufacturer:
AMA Instruments GmbH, Ulm

Approval:
For continuous ambient air monitoring of benzene concentration (stationary operation)

Measuring ranges during the suitability test:
Benzene 0 – 50 µg/m³

Software version:
GC 5000 BTX Version 1.1

Restrictions:
The AMS does not have a living zero.

Remarks:
None

Test report:
Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg (LUBW), Karlsruhe, Report No.: LUBW report 143-04R / 10 of 23 November 2010

Publication in the German Federal Gazette: BAnz. 2 March 2012, No. 36, page 920, chapter V notification 14, Announcement by UBA from 23 February 2012:

14 Notification as regards Federal Environment Agency (UBA) notices of 10 January 2011 (BAnz. p. 294, chapter III, number 1.1)

The current software version number of the GC 5000 BTX gas chromatograph in its PID version for benzene manufactured by AMA Instruments GmbH is: Version 2.1.

The measuring system can also operate with the Mean Well PS-35-24 24V/1.5A power supply instead of the Mean Well PS-25-24 24V/1.0A power supply.

Statement of TÜV Rheinland Energie und Umwelt GmbH of 29 September 2011

Publication in the German Federal Gazette: BAnz. 2 March 2012, No. 36, page 920, chapter V notification 22, Announcement by UBA from 23 February 2012:

22 Notification as regards Federal Environment Agency (UBA) notices of 10 January 2011 (BAnz. page 294, chapter III, number 1.1)

The GC 5000 BTX measuring system in its PID version for benzene manufactured by AMA instrument's GmbH for determining the concentration of benzene in the ambient air meets the requirements of the EN 14662-3 (August 2005).

Moreover, the manufacturing process and the quality management system of the GC 5000 BTX measuring system in its PID version for benzene meet the requirements of the EN 15267.

The test report on the suitability test is accessible on the Internet at www.qal1.de.

Statement of TÜV Rheinland Energie und Umwelt GmbH of 30 January 2012

Publication in the German Federal Gazette: BAnz AT 26.08.2015 B4, chapter V, notification 53, Announcement by UBA from 22 July 2015:

53 Notification as regards Federal Environment Agency (UBA) notices of 10 January 2011 (BAnz. S. 294, chapter III number 1.1) and of 23 February 2012 (BAnz. S. 920, chapter V, notification 14 and 22)

The GC 5000 BTX gas chromatograph for benzene, manufactured by AMA Instruments GmbH, has new software for its PID version. The software modules relevant for the determination of measured values are:
SS.Control v.1.0 for operation of the GC and
AMA_Peak.log v.1.0 for chromatographic evaluation.

With the launch of the new software, the following hardware changes took place:
- Replacement of the NOVA-945GSE industry PC motherboard with Perfectron INS8335A
- Integration of a touch screen panel instead of previously used display and monitor
- Upgrade from Windows XP to Windows 7

Statement of TÜV Rheinland Energie und Umwelt GmbH of 23 March 2015

Publication in the German Federal Gazette: BAnz AT 14.03.2016 B7, chapter V notification 3, Announcement by UBA from 18 February 2016:

3 Notification as regards Federal Environment Agency (UBA) notices of 10 January 2011 (BAnz. page 294, chapter III number 1.1) and of 22 July 2015 (BAnz AT 26.08.2015 B4, chapter V notification 53)

The measuring device GC 5000 BTX version PID for benzene of the company AMA instrument's GmbH can operate also with the new amplifier module AMA Instruments product code 2895 and the new temperature controller AMA Instruments product code 2853.

Statement of TÜV Rheinland Energie und Umwelt GmbH of 21 October 2015

Certified product
This certificate applies to automated measurement systems conforming to the following description:

Online Gaschromatograph GC 5000 BTX is developed for continuous measurement of benzene, toluene, m-/p-xylene, o-xylene, and Ozone precursors (C6 to C12) in ambient air.

The tested AMS is assembled in 19 inch housing with the following technical data:

Housing 19 inch

Height:	6 rack units (U)
Depth:	600 m
Weight:	approximately 33 kg
Ambient temperature range:	0 to 40 °C

Voltage and gas supply

Voltage:	220 – 250 VAC, 50 Hz
Power:	max. 800 W
Carrier gas:	N_2 5.0 (12 ml/min)
Gas connection:	Swagelok, 1/8 inch
Detector:	PID – Photo-Ionisations-Detector

Sampling system

Pump:	Maintenance free diaphragm pump
Volume measurement:	MFC – mass flow controller with thermal sensor
Sampling duration:	15 min
Sample flow rate:	20 ml/min (normal conditions, dry)
Sampling volume:	300 ml (normal conditions, dry)

Accumulation

Adsorber:	Carbotrap
Accumulation temperature:	30 °C
Desorption temperature:	230 °C

Valve Oven

Temperature:	80 °C
Sample switch:	6-port-valve

Column Oven

Separating column:	Quartz capillary column AMAsep 1 - 0.32 mm ID/ 30 m 1.5 µm film
Temperature program:	50 °C 3 min, 8 °C/min, 130 °C 5 min
Oven cooling:	Forced cooling by opening the column oven and air recirculation

Communication interfaces

Interfaces:	2 Ethernet, RS 232, RS 485, 4 USB, PS2, VGA max. 16 analogue outputs (4 - 20 mA, 0 - 20 mA, 0 - 5 V, 0 - 10 V), digital inputs/outputs, field bus connection
Protocols:	Gesytec-II, Modbus, Profibus, others on request

General notes
This certificate is based upon the equipment tested. The manufacturer is responsible for ensuring that on-going production complies with the requirements of the EN 15267. The manufacturer is required to maintain an approved quality management system controlling the manufacture of the certified product. Both the product and the quality management systems shall be subject to regular surveillance.

If a product of the current production does not conform to the certified product, TÜV Rheinland Energy GmbH must be notified at the address given on page 1.

A certification mark with an ID-Number that is specific to the certified product is presented on page 1 of this certificate. This can be applied to the product or used in publicity material for the certified product.

This document as well as the certification mark remains property of TÜV Rheinland Energy GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energy GmbH this document shall be returned and the certificate mark must not be employed anymore.

The relevant version of this certificate and its expiration is also accessible on the internet: **qal1.de**.

Certification of Gaschromatograph GC 5000 BTX Version PID for Benzene is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Basic approval
Test report No.: 143-04R / 10 of 23 November 2010
Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg (LUBW), Karlsruhe
Publication: BAnz. 26 January 2011, No. 14, page 294, chapter III, No. 1.1
Announcement by UBA from 10 January 2011

Notifications
Statement of TÜV Rheinland Energie und Umwelt GmbH, Cologne of 29 September 2011
Publication: BAnz. 2 March 2012, No. 36, page 920, chapter V notification 14
Announcement by UBA from 23 February 2012
(new software version, new power supply)

Initial certification according to EN 15267

Certificate No. 0000034863: 16 March 2012
Expiry date of the certificate: 01 March 2017

Test report: 143-04R / 10 of 23 November 2010
Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg (LUBW), Karlsruhe
Statement of TÜV Rheinland Energie und Umwelt GmbH of 30 January 2012
Publication: BAnz. 02 March 2012, No. 36, page 920, chapter V notification 22
Announcement by UBA from 23 February 2012

Notifications according to EN 15267

Statement of TÜV Rheinland Energie und Umwelt GmbH, Cologne of 23 March 2015
Publication: BAnz AT 26.08.2015 B4, chapter V notification 53
Announcement by UBA from 22 July 2015
(new software and hardware)

Certificate No. 0000034863_01: 25 April 2016
Expiry date of the certificate: 01 March 2017

Statement of TÜV Rheinland Energie und Umwelt GmbH of 21 October 2015
Publication: BAnz AT 14.03.2016 B7, chapter V notification 3
Announcement by UBA from 18 February 2016
(new hardware parts)

Renewal of the certificate

Certificate No. 0000034863_02: 28 February 2017
Expiry date of the certificate: 01 March 2022

Total uncertainty of measurement for the laboratory test		GC 5006	GC 5007		GC 5006	GC 5007
Uncertainty of test gas*	u_{span} [µg/m³]	0,06	0,06	c_{Benz} [µg/m³]	5,0	5,0
Adjustment of calibration line	u_{fit} [µg/m³]	0,08	0,11	c_{Benz} [µg/m³]	5,0	5,0
Repeatability	u_r [µg/m³]	0,02	0,06	c_{Benz} [µg/m³]	5,9	5,9
Interfering by Ozon	u_{O3} [µg/m³]	0,01	0,06	c_{Benz} [µg/m³]	39,1	39,1
Interfering by organic components	u_{org} [µg/m³]	0,41	0,32	c_{Benz} [µg/m³]	39,1	39,1
Interfering by relative humidity	u_{rh} [µg/m³]	0,33	0,08	c_{Benz} [µg/m³]	39,1	39,1
Dependency of air pressure	u_p [µg/m³]	0,12	0,11	c_{Benz} [µg/m³]	39,1	39,1
Dependency of ambient air temperature	u_{Ts} [µg/m³]	0,22	0,37	c_{Benz} [µg/m³]	40,5	40,5
Dependency of voltage	u_V [µg/m³]	0,12	0,06	c_{Benz} [µg/m³]	39,1	39,1
Total uncertainty of measurement u_c / c [%]		**2,6**	**3,0**			
Expanded uncertainty of measurement $U_{c,rel}$ [%]		**5,2**	**6,0**			

* The uncertainty of test gas generation is ± 2,5 % (in reference to 5 µg/m³). Standard version verified over years.

Total uncertainty of measurement for the field test		GC 5006	GC 5007		GC 5006	GC 5007
Uncertainty of test gas*	u_{span} [µg/m³]	0,06	0,06	c_{Benz} [µg/m³]	5,0	5,0
Adjustment of calibration line	u_{fit} [µg/m³]	0,08	0,11	c_{Benz} [µg/m³]	5,0	5,0
Repeatability	u_r [µg/m³]	0,19	0,19	c_{Benz} [µg/m³]	40,5	40,5
Interfering by Ozon	u_{O3} [µg/m³]	0,01	0,06	c_{Benz} [µg/m³]	39,1	39,1
Interfering by organic components	u_{org} [µg/m³]	0,41	0,32	c_{Benz} [µg/m³]	39,1	39,1
Interfering by relative humidity	u_{rh} [µg/m³]	0,33	0,08	c_{Benz} [µg/m³]	39,1	39,1
Dependency of air pressure	u_p [µg/m³]	0,12	0,11	c_{Benz} [µg/m³]	39,1	39,1
Dependency of ambient air temperature	u_{Ts} [µg/m³]	0,22	0,37	c_{Benz} [µg/m³]	40,5	40,5
Dependency of voltage	u_V [µg/m³]	0,12	0,06	c_{Benz} [µg/m³]	39,1	39,1
Long term drift	u_d [µg/m³]	0,45	0,69	c_{Benz} [µg/m³]	40,5	40,5
Total uncertainty of measurement u_c / c [%]		**2,8**	**3,3**			
Expanded uncertainty of measurement $U_{c,rel}$ [%]		**5,7**	**6,7**			

* The uncertainty of test gas generation is ± 2,5 % (in reference to 5 µg/m³). Standard version verified over years.

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Air quality and industrial site monitoring

Online gas chromatograph – GC 5000 series

Optimized for monitoring of organic pollutants in ambient air
The GC 5000 series of gas chromatographs have been developed for the continuous monitoring of organic compounds. The instruments are characterized by their rugged and compact design and their outstanding detection sensitivity in the low ppb to ppt range. The instruments allow for cabinet/rack mounting in AQMS, containers and mobile vans for monitoring of air pollutants in unattended operation mode.

Various configurations of the GC 5000 series are available to cover a wide range of applications, such as monitoring of BTEX acc. European Directive 2008/50/EC, monitoring of ozone precursors acc. to the PAMS target list of VOC's published by the U.S. EPA, monitoring of sulfur organic compounds, solvents, chlorinated hydrocarbons and other organic pollutants and air toxics.

The GC 5000 series of analyzers is type approved and QAL1 certified by German TÜV acc. EN 14662-3 and EN 15267 for monitoring of benzene in ambient air. This proofs the high quality standard of the instruments and its suitability for air quality and industrial site monitoring applications.

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Advanced sample enrichment technology
The GC 5000 series features either single stage or dual-stage sample pre-concentration of organic compounds. Fully automated air sampling is performed using an integrated, low-maintenance membrane pump. Both – sampling flow rate and sampling volume – will be measured and controlled precisely using a digital mass flow controller and is not affected by any fluctuations in ambient pressure and temperature.

The single-stage sample enrichment module allows for quantitative pre-concentration of volatile organic compounds in the range from C4 to C12. Subsequent sample introduction is performed by means of thermal desorption technique. Digital PID temperature control, active peltier-cooling and heating of the adsorbent tube using high, but precisely controlled short circuit currents, allow for well controlled temperatures during sampling and sample introduction.

Optionally the GC 5000 series features unique dual-stage sample enrichment technology for pre-concentration of very low boiling organic compounds, such as ethane, ethylene and acetylene. Breakthrough of these extremely volatile compounds will be avoided even at sampling temperatures well above 0°C due to a high capacity pre-concentration tube. This allows to retaining low boiling organic compounds quantitatively and avoids freezing of the flow path while atmospheric humidity will be high. Prior to sample introduction, the organic compounds will be focused on a second stage providing for distinct and well separated peaks in the chromatogram.

Field proven detector technology
AMA Instruments GmbH has more than 20 years of experience in developing and manufacturing of GC detectors. Two types of detectors are available for the GC 5000 series, a Flame Ionization Detector (FID) and a Photo Ionization Detector (PID). Both detectors have especially been designed for air quality monitoring applications in the field and are characterized by their ruggedness, superior long-term stability, excellent reproducibility and unmatched detection sensitivity.

Many PID's having mainly been developed for laboratory type of gas chromatographs and using DC operated high voltage UV lamps are known for their significant drift over longer periods of time. Therefore these common PID's are not ideally suited for field operation. In contrast to this, the PID available for the GC 5000 series is using a RF excited UV lamp providing excellent long-term stability. Also detection sensitivity of this type of detector is superior and allows for monitoring of benzene at concentration levels of 10 ppt (MDL) or even lower.

System control software with powerful PEAK.log™ Chromatography Data System
The system control software for the GC 5000 series allows to controlling complete monitoring systems combining just one or even more GC systems with a dilution calibrator and additional gas generators. All data, settings, chromatograms and results will be stored in a SQL database and can easily be retrieved. The powerful **PEAK.log™** Chromatography Data System is fully integrated into the system control software and offers unique features, such as peak shift compensation.

AMA INSTRUMENTS

TECHNICAL DATA

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General	
Dimensions, weight	19" x 6 HU x 600 mm, appr. 35 kg – depending on instrument configuration
Mounting	designed for cabinet/rack mounting, telescopic slide mounting recommended
Ambient conditions	0°C to 40°C, 5% to 95% relative humidity, non-condensing
EMC	CE-marking, conformity with EMC-guideline 2004/108/EG
Display	Glass front panel with integrated 12,1" TFT display, resolution 1280 x 800 pixel
Instrument control	integrated industrial PC board, MS Windows based system control software
Data storage	integrated solid state disk (SSD), SQL database
EMC	CE-marking, conformity with EMC-guidelines 2004/108/EG

Instrument supply	
Power supply	220 - 250 VAC, 100-120 VAC (optional)
Line frequency	50 - 60 Hz
Power consumption	max. 800 W
Carrier gas	N_2 (GC grade, min. 5.0) or H_2 (for FID only, GC grade, min 6.0), 3 bar
Supply gases	Combustion air, GC Grade, min. 3 bar (for FID only) H_2, GC Grade, min. 3 bar (for FID only)
Supply connections	1/8" bulkhead union
Pressure control	Integrated pressure regulators, electronic readout of carrier gas pressure, manometer for indication of combustion air pressure (for FID only)
Flow control	MFC for precise flow control of hydrogen supply (for FID only)

Sampling	
Sampling	Integrated, low-maintenance membrane pump for automated air sampling
Flow rate control	MFC for precise measurement and control of sampling flow rate and sampling volume irrespective of fluctuations in atmospheric pressure and temperature
Sampling time	0-99 min (adjustable)
Flow rate	10-50 sccm/min (adjustable)
Sample volume	Typical 200-800 sccm (adjustable)

Sample pre-concentration	
Single-stage	Single-stage sample enrichment module • suitable for organic components ≥ C_4 • allows for sample pre-concentration and subsequent sample introduction by means of thermal desorption technique
Dual-stage	Dual-stage sample enrichment module • suitable for organic components from C_1 to C_6 • allows for sample pre-concentration, sample focusing and sample introduction by means of thermal desorption technique
Typical parameters	• active peltier cooling and heating for precise temperature control of enrichment & focusing tubes • typical enrichment/focusing temperature 10°C … 30°C (adjustable) • max. desorption/injection temperature 350°C (adjustable) • typical heating-up rate 40°C/s

Valve oven	
Oven liner	Stainless steel
Internal dimensions	H 210 mm x W 80 mm x D 55 mm
Heated valve block	Closed loop PID temperature control, adjustable from 30-150°C
Sample valve	up to three 6-Port or 10-Port rotary type VALCO valves, electrically actuated

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Column oven	
Oven liner	Stainless steel
Internal dimensions	H 210 mm x W 210 mm x D 55 mm
Columns	• analytical column, fused silica capillary, max. length 60 m • stripping column (optional), fused silica capillary
Heating	Forced air
Temperature	range 40°C to 210°C
Temperature control	Closed loop PID temperature control, setpoint resolution 1°C
Temperature program	3 linear heating ramps, 4 isothermal holds
Heating rate	1°C/min to 25°C/min, setpoint resolution 1°C/min
Oven cooling	Fast cooling down time due to forced air cooling

Type of detectors	
FID	FID – Flame Ionization Detector • temperature controlled detector body • linear detector response & superior long-term stability • requires H_2 and combustion air supply
PID	PID – Photo Ionization Detector • temperature controlled detector body • electrodeless, RF excited UV lamp for excellent long-term stability and extended lifetime

Communication	
Communication ports	2 x Ethernet, RS-232 / RS-485, 4 x USB, VGA
Protocols	GESYTEC I (Bayern-Hessen), GESYTEC II, Modbus RTU

Standard Configurations	
GC 5000 BTX	Single-stage sample enrichment, FID or PID, analytical column AMAsep 1, monitoring of BTEX, styrene and ozone precursors (C_6-C_{12})
GC 5000 B-BTX	Single-stage sample enrichment, FID or PID, analytical column AMAsep SilicaPLOT, monitoring of 1,3-butadiene & BTEX
GC 5000 VOC	Dual-stage sample enrichment, FID, analytical column AMAsep AluminaPLOT, stripping column AMAsep WAX, monitoring of ozone precursors (C_2-C_5)
GC 5000 Organic Sulfur	High-capacity single-stage sample enrichment, Sulfinert® coating of tubing, fittings and valves, PID, analytical column AMAsep SilicaPLOT, monitoring of sulfur organic compounds, such as methyl sulfide, dimethyldisufide, mercaptanes, … & benzene and toluene

Note: Other configurations of the GC 5000 series for specific applications on request.

Options and accessories	
	• Glass front panel with 12,1" capacitive TFT touch screen, resolution 1280 x 800 pixel • Calibration gas selector (Sample, Cal1, Cal2) • DIM 200 – Dilution Calibrator for fully automated multi-level calibrations and/or fully automated instrument validation (zero/span check) • HG 300 – HP Hydrogen Generator for supply of combustion gas • HG 500 – UHP Hydrogen Generator for supply of combustion gas and carrier gas • ZAG 300 – HP Zero Air Generator for supply of hydrocarbon free zero air

Umwelt Bundesamt

TÜVRheinland®
Precisely Right.

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000040219

Certified AMS:	Model 48i for CO
Manufacturer:	Thermo Fisher Scientific 27 Forge Parkway Franklin, MA 02038 USA
Test Institute:	TÜV Rheinland Energie und Umwelt GmbH

This is to certify that the AMS has been tested and found to comply with:

VDI 4202-1: 2002, VDI 4203-2: 2004, EN 14626: 2012, EN 15267-1: 2009, EN 15267-2: 2009

Certification is awarded in respect of the conditions stated in this certificate (see also the following pages).

TÜVRheinland® CERTIFIED

Suitability Tested
Complying with
2008/50/EC
EN 15267
Regular
Surveillance

www.tuv.com
ID 0000040219

Publication in the German Federal Gazette (BAnz.) of 08 April 2006

This certificate will expire on:
31 March 2019

German Federal Environment Agency
Dessau, 29 April 2014

i. A. Dr. Marcel Langner

TÜV Rheinland Energie und Umwelt GmbH
Cologne, 28 April 2014

ppa. Dr. Peter Wilbring

www.umwelt-tuv.de / www.eco-tuv.com teu@umwelt-tuv.de Tel. +49 221 806-5200	TÜV Rheinland Energie und Umwelt GmbH Am Grauen Stein 51105 Cologne
Accreditation according to EN ISO/IEC 17025 and certified according to ISO 9001:2008.	

Umwelt Bundesamt

Certificate:
0000040219 / 29 April 2014

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Test report:	936/21203248/A1 of 05 January 2006, Addendum 936/21221382/D of 04 October 2013
Initial certification:	01 April 2014
Date of expiry:	31 March 2019
Publication:	BAnz AT 01 April 2014 B12, chapter VI, notification 24

Approved application
The certified AMS is suitable for continuous monitoring of CO in ambient air.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a three-month field test.

The AMS is approved for a temperature range of 0 °C to +30 °C.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for ambient air applications at which it will be installed.

Basis of the certification
This certification is based on:

- test report 936/21203248/A1 of 05 January 2006 of TÜV Rheinland Immissionsschutz und Energiesysteme GmbH and Addendum 936/21221382/D of 04 October 2013 of TÜV Rheinland Energie und Umwelt GmbH
- suitability announced by the German Federal Environment Agency (UBA) as the relevant body
- the on-going surveillance of the product and the manufacturing process
- publication in the German Federal Gazette (BAnz. 08 April 2006, No. 70, p. 2653, chapter IV, No. 2.2, UBA publication from 21 February 2006)
- publication in the German Federal Gazette (BAnz. 20 April 2007, No. 75, p. 4139, chapter IV, notification 1 and 6, UBA publication from 12 April 2007)
- publication in the German Federal Gazette (BAnz. 03 September 2008, No. 133, p. 3243, chapter IV, notification 14, UBA publication from 12 August 2008)
- publication in the German Federal Gazette (BAnz. 25 August 2009, No. 125, p. 2929, chapter III, notification 18, UBA publication from 03 August 2009)
- publication in the German Federal Gazette (BAnz. 28 July 2010, No. 111, p. 2597, chapter III, notification 6, UBA publication from 12 July 2010)
- publication in the German Federal Gazette (BAnz. 29 July 2011, No. 113, p. 2725, chapter III, notification 20, UBA publication from 15 July 2011)
- publication in the German Federal Gazette (BAnz AT 20 July 2012 B11, chapter IV, notification 25, UBA publication from 06 July 2012)
- publication in the German Federal Gazette (BAnz AT 05 March 2013 B10, chapter V, notification 14, UBA publication from 12 February 2013)
- publication in the German Federal Gazette (BAnz AT 01 April 2014 B12, chapter VI, notification 24, UBA publication from 27 February 2014)

AMS designation:
CO-analyzer Model 48i

Manufacturer:
Thermo Electron Corp. Franklin, MA 02038 USA and D-91056 Erlangen

Field of application:
For continuous monitoring of CO in ambient air.

Measuring ranges during the performance test:
CO 0 - 60 mg/m³
0 - 100 mg/m³

Software:
Version: V 01.02.14.097

Testing institute:
TÜV Immissionsschutz und Energiesysteme GmbH, Cologne
TÜV Rheinland Group

Test report:
Report No.: 936/21203248/A of 5 January 2006

1 Notification of German Federal Environment Agency

The new name of Thermo Electron Corp., Franklin, USA is Thermo Fisher Scientific, Franklin, USA.

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme, 51101 Cologne, Germany, Dr. Peter Wilbring, dated 20th December 2006

6 Notification of announcements by the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2653) and 12th September 2006 (BAnz. p. 6715)

The measuring systems model 42i for nitrogen oxide, model 43i for sulphur dioxide, model 48i for carbon monoxide and model 49i for ozone, manufactured by Thermo Fisher Scientific, MA 02038, USA, are also manufactured and sold identically and to the same standards by MLU-Monitoring für Leben und Umwelt Ges.m.b.H., Mödling, Austria.

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme, 51101 Cologne, Germany, Dr. Peter Wilbring, dated 14th December 2006

14 Notification of announcement by the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2655)

The current software version of the ambient air measuring system 48i by Thermo Fisher Scientific is:

V 01.05.03 (106423-00)

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 10th March 2008

18 Notification of announcement of the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2655)

The current software version of the ambient air measuring system 48i by Thermo Fisher Scientific is:

V 01.06.01 (108458-00)

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 1st April 2009

6 Notification of announcements by the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2655) and 3rd August 2009 (BAnz. p. 2936)

The ambient air measuring system 48i by Thermo Fisher Scientific can now also be operated with a sample gas pump of type PU1959-N86-3.07 manufactured by KNF.

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 23rd March 2010

20 Notification of announcements by the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2653, Chapter IV Number 2.2) and 12th July 2010 (BAnz. p. 2597, Chapter III 6th notification)

The current software version of the ambient air measuring system 48i for CO by Thermo Fisher Scientific is:

V 01.06.09 (110018-00)

Statement of TÜV Rheinland Energie und Umwelt GmbH dated 30th March 2011

25 Notification of announcements by the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2653, Chapter IV Number 2.2) and 15th July 2011 (BAnz. p. 2725, Chapter III 20th notification)

The ambient air measuring system model 48i for CO by Thermo Fisher Scientific will be equipped with the PU2737-N86 vacuum pump manufactured by KNF.

Statement by TÜV Rheinland Energie und Umwelt GmbH dated 20th March 2012

14 Notification of announcements by the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2653, Chapter IV Number 2.2) and 6th July 2012 (BAnz AT 20.07.2012, Chapter IV 25th notification)

The current software version for the ambient air measuring system 48i for CO by Thermo Fisher Scientific is:

V 01.06.10 (112308-00)

Statement by TÜV Rheinland Energie und Umwelt GmbH dated 6th October 2012

24 Notification of announcements by the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2653, Chapter IV Number 2.2) and 12th February 2013 (BAnz AT 05.03.2013 B10, Chapter V, 14th notification).

The measuring system model 48i for CO by Thermo Fisher Scientific fulfils the requirements of Standard EN 14626 (December 2012). Furthermore, the manufacturing process and quality management system of the measuring system model 48i for CO fulfil the requirements of EN 15267.

The test report of the performance test with report number 936/21203248/A1 as well as an addendum as an integral part of the test report with report number 936/21221382/D can be viewed on the internet at www.qal1.de.

The Arcturus Bd. 101491-xx processor board was withdrawn and replaced by the new Arcturus Bd. 110570-xx processor board.

The current software version of the measuring system is:

V 02.00.01 (113420-00)

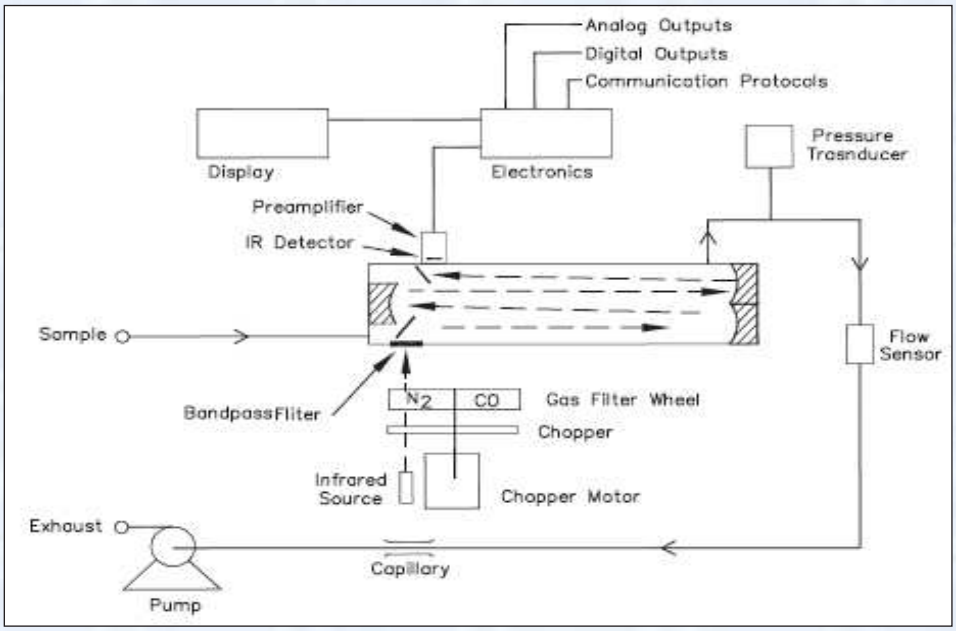
Statement by TÜV Rheinland Energie und Umwelt GmbH dated 1st October 2013

Certified product
This certificate applies to automated measurement systems conforming to the following description:

The model 48i CO analyser measures CO concentration based on the gas filter correlation method. The model 48i analyser functions according to the principle that carbon monoxide (CO) absorbs infra-red radiation on a wavelength of 4.6 micrometres. The measuring system belongs to the photometric measuring system group. The measuring principle is based on the determination of light absorption by the gas to be measured in the gas's characteristic wavelength ranges. Analysis is performed by measuring absorption on the basis of the dependence between the gas concentration and the amount of absorbed light according to the Beer-Lambert law:

$$I = I_0 * e^{-\alpha L c}$$

Io as light intensity without absorption
I as intensity with absorption
L as absorption path or distance that the light travels during absorption
c as concentration of the absorbing gas, in this case CO
□ as absoprtion coefficient (provides information about degree of absorption)



The measuring principle complies with the standard reference method as stipulated in EN 14626.

The sample is drawn into the model 48i through the sample bulkhead. The sample flows through the optical bench. Radiation from an infrared source is chopped and then passed through a gas filter alternating between CO and N_2. The radiation then passes through a narrow band pass interference filter and enters the optical bench where absorption by the sample gas occurs. The infrared radiation then exits the optical bench and falls on an infrared detector.

The CO gas filter acts to produce a reference beam which cannot be further attenuated by CO in the sample cell. The N_2 side of the filter wheel is transparent to the infrared radiation and therefore produces a measure beam which can be absorbed in the cell. The chopped detector signal is modulated by the alternation between two gas filters with a amplitude related to the concentration of CO in the sample cell. Other gases do not cause modulation of the detector signal since they absorb the reference and measure beams equally. Thus, the GFC system responds specially to CO.

The Model 48i outputs the CO concentration to the front panel display, the analogue outputs, and also makes the data available over the serial or Ethernet connections.

General notes

This certificate is based upon the equipment tested. The manufacturer is responsible for ensuring that on-going production complies with the requirements of the EN 15267. The manufacturer is required to maintain an approved quality management system controlling the manufacture of the certified product. Both the product and the quality management systems shall be subject to regular surveillance.

If a product of the current production does not conform to the certified product, TÜV Rheinland Energie und Umwelt GmbH must be notified at the address given on page 1.

A certification mark with an ID-Number that is specific to the certified product is presented on page 1 of this certificate. This can be applied to the product or used in publicity material for the certified product is presented on page 1 of this certificate.

This document as well as the certification mark remains property of TÜV Rheinland Energie und Umwelt GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energie und Umwelt GmbH this document shall be returned and the certificate mark must not be employed anymore.

The relevant version of this certificate and the validity is also accessible on the internet: **qal1.de**.

Certification of Model 48i for CO is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Initial test:

Test report: 936/21203248/A1 of 05 January 2006
TÜV Immissionsschutz und Energiesysteme GmbH, Cologne

Publication: BAnz. 08 April 2006, No. 70, p. 2653, chapter IV, No. 2.2
Announcement by UBA from 21 February 2006

Initial certification according to EN 15267:

Certificate No. 0000040219: 29 April 2014

Expiration date of the certificate: 31 March 2019

Test report: 936/21203248/A1 of 05 January 2006
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne

Addendum 936/21221382/D of 04 October 2013
TÜV Rheinland Energie und Umwelt GmbH, Cologne

Publication: BAnz AT 01 April 2014 B12, chapter VI, notification 24
Announcement by UBA from 27 February 2014

Notification:

Publication: BAnz. 20 April 2007, No. 75, p. 4139, chapter IV, notification 1 and 6
Announcement by UBA from 12 April 2007

Publication: BAnz. 03 September 2008, No. 133, p. 3243, chapter IV, notification 14
Announcement by UBA from 12 August 2008

Publication: BAnz. 25 August 2009, No. 125, p. 2929, chapter III, notification 18
Announcement by UBA from 03 August 2009

Publication: BAnz. 28 July 2010, No. 111, p. 2597, chapter III, notification 6
Announcement by UBA from 12 July 2010

Publication: BAnz. 29 July 2011, No. 113, p. 2725, chapter III, notification 20
Announcement by UBA from 15 July 2011

Publication: BAnz AT 20 July 2012 B11, chapter IV, notification 25
Announcement by UBA from 06 July 2012

Publication: BAnz AT 05 March 2013 B10, chapter V, notification 14
Announcement by UBA from 12 February 2013

Publication: BAnz AT 01 April 2014 B12, chapter VI, notification 24
Announcement by UBA from 27 February 2014

info@qal1.de

Umwelt Bundesamt

Certificate:
0000040219 / 29 April 2014

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Calculation of overall uncertainty lab test (Device 1)

Measuring device:	Thermo Fisher Scientific Modell 48i			Serial-No.:	Device 1	
Measured component:	CO			8h-limit value:	8.62	µmol/mol

No.	Performance characteristic	Performance criterion	Result	Partial uncertainty		Square of partial uncertainty
1	Repeatability standard deviation at zero	≤ 0.3 µmol/mol	0.000	$u_{r,z}$	0.00	0.0000
2	Repeatability standard deviation at 8h-limit value	≤ 0.4 µmol/mol	0.020	u_r	0.00	0.0000
3	"lack of fit" at 8h-limit value	≤ 4.0% of measured value	0.800	u_l	0.04	0.0016
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	≤ 0.7 µmol/mol/kPa	0.090	u_{gp}	0.22	0.0502
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.010	u_{gt}	0.02	0.0005
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.030	u_{st}	0.07	0.0047
7	Sensitivity coefficient of electrical voltage at 8h-limit value	≤ 0.3 µmol/mol/V	0.000	u_V	0.00	0.0000
8a	Interferent H_20 with 21 mmol/mol	≤ 1.0 µmol/mol (Zero)	0.040	u_{H2O}	0.03	0.0009
		≤ 1.0 µmol/mol (Span)	0.000			
8b	Interferent CO_2 with 500 µmol/mol	≤ 0.5 µmol/mol (Zero)	-0.060	$u_{int,pos}$	0.04	0.0014
		≤ 0.5 µmol/mol (Span)	-0.010			
8c	Interferent NO with 1 µmol/mol	≤ 0.5 µmol/mol (Zero)	0.000	or		
		≤ 0.5 µmol/mol (Span)	-0.010			
8d	Interferent N_2O with 50 nmol/mol	≤ 0.5 µmol/mol (Zero)	0.170			
		≤ 0.5 µmol/mol (Span)	0.060	$u_{int,neg}$		
9	Averaging effect	≤ 7.0% of measured value	-5.970	u_{av}	-0.30	0.0883
18	Difference sample/calibration port	≤ 1.0%	0.000	$u_{\Delta sc}$	0.00	0.0000
21	Uncertainty of test gas	≤ 3.0%	2.000	u_{cg}	0.09	0.0074

Combined standard uncertainty	u_c	0.3937	µmol/mol
Expanded uncertainty	U	0.7875	µmol/mol
Relative expanded uncertainty	W	9.14	%
Maximum allowed expanded uncertainty	W_{req}	15	%

Calculation of overall uncertainty lab test (Device 2)

Measuring device:	Thermo Fisher Scientific Modell 48i			Serial-No.:	Device 2	
Measured component:	CO			8h-limit value:	8.62	µmol/mol

No.	Performance characteristic	Performance criterion		Result	Partial uncertainty		Square of partial uncertainty	
1	Repeatability standard deviation at zero	≤	0.3 µmol/mol	0.000	$u_{r,z}$	0.00	0.0000	
2	Repeatability standard deviation at 8h-limit value	≤	0.4 µmol/mol	0.020	u_r	0.00	0.0000	
3	"lack of fit" at 8h-limit value	≤	4.0% of measured value	-0.300	u_l	-0.01	0.0002	
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	≤	0.7 µmol/mol/kPa	0.090	u_{gp}	0.22	0.0502	
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	≤	0.3 µmol/mol/K	0.040	u_{gt}	0.09	0.0084	
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	≤	0.3 µmol/mol/K	0.030	u_{st}	0.07	0.0047	
7	Sensitivity coefficient of electrical voltage at 8h-limit value	≤	0.3 µmol/mol/V	0.000	u_V	0.00	0.0000	
8a	Interferent H_20 with 21 mmol/mol	≤	1.0 µmol/mol (Zero)	-0.020	u_{H2O}	-0.01	0.0002	
		≤	1.0 µmol/mol (Span)	0.000				
8b	Interferent CO_2 with 500 µmol/mol	≤	0.5 µmol/mol (Zero)	0.000	$u_{int,pos}$	0.07	0.0052	
		≤	0.5 µmol/mol (Span)	-0.020				
8c	Interferent NO with 1 µmol/mol	≤	0.5 µmol/mol (Zero)	0.000				
		≤	0.5 µmol/mol (Span)	-0.030	or			
8d	Interferent N_2O with 50 nmol/mol	≤	0.5 µmol/mol (Zero)	0.000				
		≤	0.5 µmol/mol (Span)	0.130	$u_{int,neg}$			
9	Averaging effect	≤	7.0% of measured value	-4.560	u_{av}	-0.23	0.0515	
18	Difference sample/calibration port	≤	1.0%	0.000	$u_{\Delta sc}$	0.00	0.0000	
21	Uncertainty of test gas	≤	3.0%	2.000	u_{cg}	0.09	0.0074	

Combined standard uncertainty	u_c	0.3577	µmol/mol
Expanded uncertainty	U	0.7153	µmol/mol
Relative expanded uncertainty	W	8.30	%
Maximum allowed expanded uncertainty	W_{req}	15	%

Calculation of overall uncertainty lab and field test (Device 1)

Measuring device:	Thermo Fisher Scientific Modell 48i			Serial-No.:	Device 1	
Measured component:	CO			8h-limit value:	8.62	µmol/mol

No.	Performance characteristic	Performance criterion		Result	Partial uncertainty		Square of partial uncertainty
1	Repeatability standard deviation at zero	≤	0.3 µmol/mol	0.000	$u_{r,z}$	0.00	0.0000
2	Repeatability standard deviation at 8h-limit value	≤	0.4 µmol/mol	0.020	u_r	not considered, as ur = 0 < ur,f	-
3	"lack of fit" at 8h-limit value	≤	4.0% of measured value	0.800	u_l	0.04	0.0016
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	≤	0.7 µmol/mol/kPa	0.090	u_{gp}	0.22	0.0502
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	≤	0.3 µmol/mol/K	0.010	u_{gt}	0.02	0.0005
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	≤	0.3 µmol/mol/K	0.030	u_{st}	0.07	0.0047
7	Sensitivity coefficient of electrical voltage at 8h-limit value	≤	0.3 µmol/mol/V	0.000	u_V	0.00	0.0000
8a	Interferent H_20 with 21 mmol/mol	≤	1.0 µmol/mol (Zero)	0.000	u_{H2O}	0.03	0.0009
		≤	1.0 µmol/mol (Span)	0.040			
8b	Interferent CO_2 with 500 µmol/mol	≤	0.5 µmol/mol (Zero)	-0.060	$u_{int,pos}$	0.04	0.0014
		≤	0.5 µmol/mol (Span)	-0.010			
8c	Interferent NO with 1 µmol/mol	≤	0.5 µmol/mol (Zero)	0.000	or		
		≤	0.5 µmol/mol (Span)	-0.010			
8d	Interferent N_2O with 50 nmol/mol	≤	0.5 µmol/mol (Zero)	0.170			
		≤	0.5 µmol/mol (Span)	0.060	$u_{int,neg}$		
9	Averaging effect	≤	7.0% of measured value	-5.970	u_{av}	-0.30	0.0883
10	Reproducibility standard deviation under field conditions	≤	5.0% of average over 3 months	3.530	$u_{r,f}$	0.30	0.0926
11	Long term drift at zero level	≤	0.5 µmol/mol	0.500	$u_{d,l,z}$	0.29	0.0833
12	Long term drift at span level	≤	5.0% of max. of certification range	-2.590	$u_{d,l,8h}$	-0.13	0.0166
18	Difference sample/calibration port	≤	1.0%	0.000	$u_{\Delta sc}$	0.00	0.0000
21	Uncertainty of test gas	≤	3.0%	2.000	u_{cg}	0.09	0.0074

Combined standard uncertainty	u_c	0.5895 µmol/mol
Expanded uncertainty	U	1.1791 µmol/mol
Relative expanded uncertainty	W	13.68 %
Maximum allowed expanded uncertainty	W_{req}	15 %

info@qal1.de

Umwelt Bundesamt

Certificate:
0000040219 / 29 April 2014

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Calculation of overall uncertainty lab and field test (Device 2)

Measuring device:	Thermo Fisher Scientific Modell 48i			Serial-No.:	Device 2	
Measured component:	CO			8h-limit value:	8.62	µmol/mol

No.	Performance characteristic	Performance criterion		Result	Partial uncertainty		Square of partial uncertainty	
1	Repeatability standard deviation at zero	≤	0.3 µmol/mol	0.000	$u_{r,z}$	0.00	0.0000	
2	Repeatability standard deviation at 8h-limit value	≤	0.4 µmol/mol	0.020	u_r	not considered, as ur = 0 < ur,f	-	
3	"lack of fit" at 8h-limit value	≤	4.0% of measured value	-0.300	u_l	-0.01	0.0002	
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	≤	0.7 µmol/mol/kPa	0.090	u_{gp}	0.22	0.0502	
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	≤	0.3 µmol/mol/K	0.040	u_{gt}	0.09	0.0084	
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	≤	0.3 µmol/mol/K	0.030	u_{st}	0.07	0.0047	
7	Sensitivity coefficient of electrical voltage at 8h-limit value	≤	0.3 µmol/mol/V	0.000	u_V	0.00	0.0000	
8a	Interferent H_20 with 21 mmol/mol	≤	1.0 µmol/mol (Zero)	0.000	u_{H2O}	-0.01	0.0002	
		≤	1.0 µmol/mol (Span)	-0.020				
8b	Interferent CO_2 with 500 µmol/mol	≤	0.5 µmol/mol (Zero)	0.000	$u_{int,pos}$	0.07	0.0052	
		≤	0.5 µmol/mol (Span)	-0.020				
8c	Interferent NO with 1 µmol/mol	≤	0.5 µmol/mol (Zero)	0.000				
		≤	0.5 µmol/mol (Span)	-0.030	or			
8d	Interferent N_2O with 50 nmol/mol	≤	0.5 µmol/mol (Zero)	0.000				
		≤	0.5 µmol/mol (Span)	0.130	$u_{int,neg}$			
9	Averaging effect	≤	7.0% of measured value	-4.560	u_{av}	-0.23	0.0515	
10	Reproducibility standard deviation under field conditions	≤	5.0% of average over 3 months	3.530	$u_{r,f}$	0.30	0.0926	
11	Long term drift at zero level	≤	0.5 µmol/mol	0.500	$u_{d,l,z}$	0.29	0.0833	
12	Long term drift at span level	≤	5.0% of max. of certification range	1.840	$u_{d,l,8h}$	0.09	0.0084	
18	Difference sample/calibration port	≤	1.0%	0.000	$u_{\Delta sc}$	0.00	0.0000	
21	Uncertainty of test gas	≤	3.0%	2.000	u_{cg}	0.09	0.0074	

Combined standard uncertainty	u_c	0.5587	µmol/mol
Expanded uncertainty	U	1.1175	µmol/mol
Relative expanded uncertainty	W	12.96	%
Maximum allowed expanded uncertainty	W_{req}	15	%

Thermo Scientific Model 48*i* Carbon Monoxide Analyzer

Gas filter correlation analyzer

The Thermo Scientific™ Model 48*i* Carbon Monoxide (CO) Analyzer utilizes gas filter correlation technology to measures the amount of carbon monoxide in the air.

- Approved to meet the following standards: U.S. EPA , UK Environmental Agency and the European Union
- Ethernet connectivity for efficient remote access
- Enhanced user interface with one button programming and large display screen
- Flash memory for increased data storage and user downloadable software

The Model 48*i* analyzer is based on the principle that carbon monoxide (CO) absorbs infrared radiation at a wavelength of 4.6 microns. Because infrared absorption is a nonlinear measurement technique, it is necessary for the instrument electronics to transform the basic analyzer signal into a linear output.

The Model 48*i* analyzer uses an exact calibration curve to accurately linearize the instrument output over any range up to a concentration of 10,000ppm.

This state-of-the-art gas analyzer offers features such as an Ethernet port as well as flash memory for increased data storage.

Ethernet connectivity provides efficient remote access, allowing the user to download measurement information directly from the instrument without having to be on-site.

Easily programmable short cut keys allow you to jump directly to frequently accessed functions, menus or screens. The larger interface screen can display up to five lines of measurement information while primary screen remains visible.

Thermo Scientific Model 48i Carbon Monoxide Analyzer

Thermo SCIENTIFIC

Thermo Scientific Model 48*i* Carbon Monoxide Analyzer

Preset Ranges	0-1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000 and 10000 ppm 0-1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000 and 10000 mg/m^3
Custom Ranges	0-1 to 10000 ppm 0-1 to 10000 mg/m^3
Zero Noise	0.02 ppm RMS (30 second averaging time)
Lower Detectable Limit	0.04 ppm
Zero Drift *(24 hour)*	< 0.1 ppm
Span Drift *(24 hour)*	+/-1% full scale
Response Time	60 seconds (30 second average time)
Precision	+/-0.1 ppm
Linearity	+/-1% full scale < 1000 ppm +/-2.5% full scale > 1000 ppm
Sample Flow Rate	0.5-2 liters/min.
Operating Temperature	Performance specifications based on operation within 20°-30° C range (per U.S. EPA Guidelines). Instrument may be safely operated over the range of 0°-45° C.
Power Requirements	100 VAC, 115 VAC, 220-240 VAC +/-10% @ 275W
Size and Weight	16.75"(W) x 8.62"(H) x 23"(D), 49 lbs. (22.2 kg)
Outputs	Selectable voltage, RS232/RS485, TCP/IP, 10 status relays and power fail indication (standard) 0-20 or 4-20 mA isolated current output (optional)
Inputs	16 digital inputs (standard), 8 0-10 Vdc analog inputs (optional)
Approvals and Certifications	U.S. EPA Reference Method: RFCA-0981-054 MCERTS Certified: Sira MC070095/00 EN14626: TÜV 936/21203248/A Report

Ordering Information

Model 48*i* Carbon Monoxide Analyzer
Choose from the following configurations/options to customize your own Model 48*i* analyzer

1. Voltage options:
A = 120 VAC 50/60 Hz (standard)
B = 220 VAC 50/60 Hz
J = 100 VAC 50/60 Hz

2. Internal zero / span and/or Oxygen Sensor:
N = No zero / span valve assembly (standard)
A = No zero/ span valve w/ Zero Air Scrubber
Z = Internal zero / span valve assembly
C = Internal zero / span valve w/ Zero Air Scrubber
G = Oxygen Sensor with NO Zero/Span
R = Oxygen Sensor with Zero/Span

3. Filter wheel purge:
S = Standard plumbing (standard)
P = Filter wheel purge setup

4. Optional I/O:
A = No optional I/O (standard)
C = 4-20mA current output - 6 channels, 0-10v analog input - 8 channel

5. Mounting hardware:
A = Bench mounting and Ears/Handles, EIA

Your Order Code:
Model 48i - _ _ _ _ _

To maintain optimal product performance, you need immediate access to experts worldwide, as well as priority status when your air quality equipment needs repair or replacement. We offer comprehensive, flexible support solutions for all phases of the product life cycle. Through predictable, fixed-cost pricing, our services help protect the return on investment and total cost of ownership of your Thermo Scientific products.

For more information, visit our website at thermoscientific.com

This product is manufactured in a plant whose quality management system is ISO 9001 certified.

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Umwelt Bundes Amt
For our Environment

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CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000039320

Certified AMS:	Model 49i for O_3
Manufacturer:	Thermo Fisher Scientific 27 Forge Parkway Franklin, MA 02038 USA
Test Institute:	TÜV Rheinland Energie und Umwelt GmbH

This is to certify that the AMS has been tested and found to comply with:

VDI 4202-1: 2002, VDI 4203-2: 2004, EN 14625: 2012, EN 15267-1: 2009, EN 15267-2: 2009

Certification is awarded in respect of the conditions stated in this certificate (see also the following pages).

TÜVRheinland® CERTIFIED

Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000039320

Publication in the German Federal Gazette (BAnz.) of 08 April 2006

This certificate will expire on:
22 July 2018

German Federal Environment Agency
Dessau, 20 August 2013

i. A. Dr. Marcel Langner

TÜV Rheinland Energie und Umwelt GmbH
Cologne, 19 August 2013

ppa. Dr. Peter Wilbring

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TÜV Rheinland Energie und Umwelt GmbH
Am Grauen Stein
51105 Cologne

Accreditation according to EN ISO/IEC 17025 and certified according to ISO 9001:2008.

Umwelt Bundes Amt
For our Environment

Certificate:
0000039320 / 20 August 2013

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Test report:	936/21203248/B1, Statement of 17 November 2011, Addendum 936/21221382/A
Initial certification:	23 July 2013
Date of expiry:	22 July 2018
Publication:	BAnz AT 23 July 2013 B4, chapter V, notification 22

Approved application
The certified AMS is suitable for continuous ambient air monitoring for O_3 (stationary operation).

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a three-month field test.

The AMS is approved for a temperature range of +5 °C to +40 °C.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for ambient air applications at which it will be installed.

Basis of the certification
This certification is based on:

- test report 936/21203248/B1 of 05 January 2006 of TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Statement of 17 November 2011 and Addendum 936/21221382/A of 21 March 2013 of TÜV Rheinland Energie und Umwelt GmbH
- suitability announced by the German Federal Environment Agency (UBA) as the relevant body
- the on-going surveillance of the product and the manufacturing process
- publication in the German Federal Gazette (BAnz. 08 April 2006, No. 70, p. 2653, chapter IV, No. 3.2)
- publication in the German Federal Gazette (BAnz. 20 April 2007, No. 75, p. 4139, chapter IV, notification 1)
- publication in the German Federal Gazette (BAnz. 03 September 2008, No. 133, p. 3242, chapter IV, notification 15)
- publication in the German Federal Gazette (BAnz. 25 August 2009, No. 125, p. 2929, chapter III, notification 19)
- publication in the German Federal Gazette (BAnz. 28 July 2010, No. 111, p. 2597, chapter III, notification 7)
- publication in the German Federal Gazette (BAnz. 29 July 2011, No. 113, p. 2725, chapter III, notification 21)
- publication in the German Federal Gazette (BAnz. 02 March 2012, No. 36, p. 920, chapter V, notification 1)
- publication in the German Federal Gazette (BAnz AT 20 July 2012 B11, chapter IV, notification 26)
- publication in the German Federal Gazette (BAnz AT 23 July 2013 B4, chapter V, notification 22)

AMS designation:
Ozon analyzer Model 49 i

Manufacturer:
Thermo Electron Corporation Franklin, MA 02038 USA and 91056 Erlangen

Field of application:
For continuous ambient air monitoring for O_3 (stationary operation)

Measuring ranges during the performance test:
O_3 0 - 360 µg/m³
0 - 500 µg/m³

Software version:
Version: V 01.01.02.105

Testing institute:
TÜV Immissionsschutz und Energiesysteme GmbH, Köln, TÜV Rheinland Group

Test report:
No.: 936/21293248/B1 of 05 January 2006

1 Notification on announcements of the Federal Environment Agency of 12 April 2007 (BAnz. p. 4139, No. 75, chapter IV, notification 1)

The current name of the company Thermo Electron Corp., Franklin, USA, is Thermo Fisher Scientific, Franklin, USA.

Statement of TÜV Rheinland Immissionsschutz und Energiesysteme, 51101 Cologne, Dr. Peter Wilbring, of 20 December 2006

15 Notification on announcements of the Federal Environment Agency of 21 February 2006 (BAnz. p. 2655)

The current software version of the ambient air monitoring system 49i of the company Thermo Fisher Scientific is:

V 01.05.00 (105115-00)

Statement of TÜV Rheinland Immissionsschutz und Energiesysteme of 10 March 2008

19 Notification with regard to the UBA announcement of February 21st, 2006 (BAnz. p. 2655)

The current software version of the ambient air monitoring system 49i of the company Thermo Fisher Scientific is:

V 01.06.01 (108459-00)

Statement of TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, April 1st, 2009

7 Notification with regard to the Federal Environment Agency (UBA) announcement of 21 February 2006 (BAnz. p. 2655) and of 3 August 2009 (BAnz. p. 2936)

The ambient air measuring system 49i of the company Thermo Fisher Scientific may now also be used with the sample gas pump type PU1959-N86-3.07 of the company KNF.

Statement of TÜV Rheinland Immissionsschutz und Energiesysteme GmbH of 23 March 2010

21 Notification on announcements of the Federal Environment Agency of 12 February 2006 (BAnz. p. 2653, chapter IV number 3.2) and of 12 July 2010 (BAnz. p. 2597, chapter III, 7th notification)

The current software version of the ambient air monitoring system Model 49i for O_3 of the company Thermo Fisher Scientific is:

V 01.06.04 (109898-00)

Statement of TÜV Rheinland Energie und Umwelt GmbH of 30 March 2011

1 Notification on announcements of the Federal Environment Agency of 21 February 2006 (BAnz. p. 2653, chapter IV number 3.2) and of 15 July 2011 (BAnz. p. 2725, chapter III 21th notification)

The current software version of the ambient air monitoring system Model 49i for O_3 of the company Thermo Fisher Scientific is:

V 01.06.08 (111276-00)

Instead of the so far used measuring cell consisting of a polyurethane-coated aluminimum tube, it is also possible now to use a measuring cell consisting of an aluminium tube and an integrated FEP tube.

Statement made by TÜV Rheinland Energie und Umwelt GmbH of 17 November 2011

26 Notification on announcements of the Federal Environment Agency of 21 February 2006 (BAnz. p. 2653, chapter IV number 3.2) and announcements of the Federal Environment Agency of 23 February 2012 (BAnz. p. 920, chapter V 1th notification)

The ambient air monitoring system Model 49i of the company Thermo Fisher Scientific for ozone will be equipped in future with a vacuum pump of the company KNF of the type PU2737-N86.

Statement made by TÜV Rheinland Energie und Umwelt GmbH of 20 March 2012

22 Notification on announcements of the Federal Environmental Agency of 21 February 2006 (BAnz. p. 2929, chapter IV no. 3.2) and of 6 July 2012 (BAnz. AT of 20 July 2012 B11, chapter IV, 26th notification)

The Model 49i measuring system for O_3, manufactured by Thermo Fisher Scientific, fulfils the requirements of EN 14625 (December 2012). In addition, the production and quality management system of the measuring system meet the requirements of EN 15267.

The performance test report no. 936/21203248/B1, a statement of TÜV Rheinland Energie und Umwelt GmbH dated 17 November 2011 as well as the addendum as integral part of report no. 936/21221382/A are available online at www.qal1.de.

Statement made by TÜV Rheinland Energie und Umwelt GmbH of 21 March 2013

Certified product

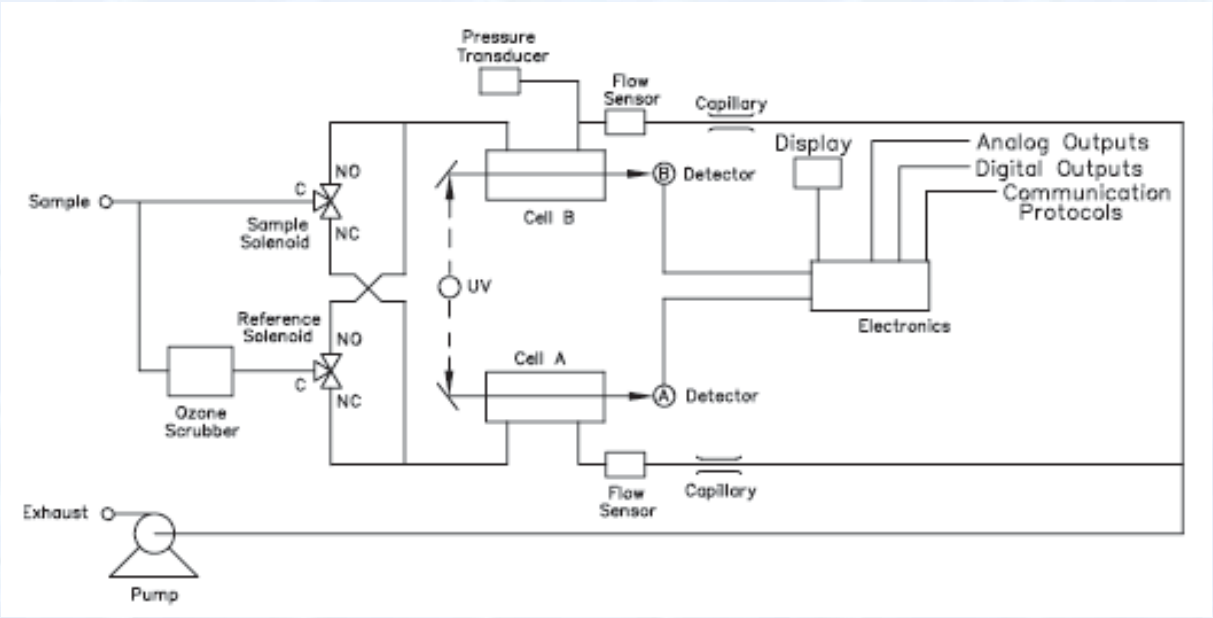
This certificate applies to automated measurement systems conforming to the following description:

The Model 49i measuring system operates under the principle of light absorption to determine the measured gas by its characteristic wavelength. For the component ozone, the absorption wavelength lies in the UV range of 254 nm, corresponding to the reference method described in Standard EN 14625.

The ambient air sample is sucked through the bulkhead connection with designation SAMPLE into the Model 49i measuring system and divided into two streams. One gas stream passes through an ozone scrubber and is used as reference gas (I_0). The reference gas then streams toward the magnetic valve. The sample gas (I) directly flows to the sampling magnetic valve. The magnetic valves alternate between reference and sample gas streams between cells A and B every 10 seconds. When cell A is filled with reference gas, cell B is filled with sample gas, and vice versa.

The UV light intensities of both cells are measured by detectors A and B. When the magnetic valves direct the reference and sample gas to the respective opposite cell, the light intensities are disregarded for a few seconds in order to flush the cells clean. The Model 49i measuring system calculates the ozone concentration in each cell. The average concentration is shown on the front display and produced via analogue outputs. The measurement data are provided via serial or Ethernet interface.

The following figure illustrates the spatial configuration of the analyser assemblies.



General notes

This certificate is based upon the equipment tested. The manufacturer is responsible for ensuring that on-going production complies with the requirements of the EN 15267. The manufacturer is required to maintain an approved quality management system controlling the manufacture of the certified product. Both the product and the quality management systems shall be subject to regular surveillance.

If a product of the current production does not conform to the certified product, TÜV Rheinland Energie und Umwelt GmbH must be notified at the address given on page 1.

A certification mark with an ID-Number that is specific to the certified product is presented on page 1 of this certificate. This can be applied to the product or used in publicity material for the certified product is presented on page 1 of this certificate.

This document as well as the certification mark remains property of TÜV Rheinland Energie und Umwelt GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energie und Umwelt GmbH this document shall be returned and the certificate mark must not be employed anymore.

The relevant version of this certificate and the validity is also accessible on the internet: **qal1.de**.

Certification of Model 49i for O_3 is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Initial test:

Test report: 936/21203248/B1 of 05 January 2006
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne

Publication: BAnz. 08 April 2006, No. 70, p. 2653, chapter IV, No. 3.2
Announcement by UBA from 21 February 2006

Initial certification according to EN 15267:

Certificate No. 0000039320: 20 August 2013

Expiration date of the certificate: 22 July 2013

Test report: 936/21203248/B1 of 05 January 2006
TÜV Rheinland Energie und Umwelt GmbH, Cologne

Publication: BAnz AT 23 July 2013 B4, chapter V, notification 22
Announcement by UBA from 03 July 2013
(fulfils the requirements of EN 14625 (December 2012),fulfils the requirements of EN 15267for the production and quality management system of the measuring system)

Notification:

Publication: BAnz. 20 April 2007, No. 75, p. 4139, chapter IV, notification 1
Announcement by UBA from 12 April 2007 *(name change)*

Publication: BAnz. 03 September 2008, No. 133, p. 3242, chapter IV, notification 15
Announcement by UBA from 12 August 2008 *(software change)*

Publication: BAnz. 25 August 2009, No. 125, p. 2929, chapter III, notification 19
Announcement by UBA from 03 August 2009 *(software change)*

Publication: BAnz. 28 July 2010, No. 111, p. 2597, chapter III, notification 7
Announcement by UBA from 12 July 2010 *(pump)*

Publication: BAnz. 29 July 2011, No. 113, p. 2725, chapter III, notification 21
Announcement by UBA from 15 July 2011 *(software change)*

Publication: BAnz. 02 March 2012, No. 36, p. 920, chapter V, notification 1
Announcement by UBA from 23 February 2012 *(software + measuring cell)*

Publication: BAnz AT 20 July 2012 B11, chapter IV, notification 26)
Announcement by UBA from 06 July 2012 *(pump)*

Calculation of overall uncertainty (Device 1)

Measuring device:	Thermo Fisher Scientific Model 49i					Serial number:	Gerät 1	
Measured component:	O3					1h-Alert threshold:	120	nmol/mol

No.	Performance characteristic	Performance criterion	Result	Partial uncertainty		Square of partial uncertainty	
1	Repeatability standard deviation at zero	≤ 1.0 nmol/mol	0,100	$u_{r,z}$	0,03	0,0007	
2	Repeatability standard deviation at 1h-limit value	≤ 3.0 nmol/mol	0,100	$u_{r,lh}$	0,03	0,0007	
3	"lack of fit" at 1h-limit value	≤ 4.0% of meas. value	1,500	$u_{l,lh}$	1,04	1,0800	
4	Sensitivity coefficient of sample gas pressure at 1h-limit value	≤ 2.0 nmol/mol/kPa	0,100	u_{gp}	1,04	1,0800	
5	Sensitivity coefficient of sample gas temperature at 1h-limit value	≤ 1.0 nmol/mol/K	0,054	u_{gt}	0,56	0,3149	
6	Sensitivity coefficient of surrounding temperature at 1h-limit value	≤ 1.0 nmol/mol/K	-0,230	u_{st}	-1,59	2,5392	
7	Sensitivity coefficient of electrical voltage at 1h-limit value	≤ 0.30 nmol/mol/V	0,020	u_V	0,30	0,0885	
8a	Interferent H_20 with 21 mmol/mol	≤ 10 nmol/mol (Zero)	-0,980	u_{H2O}	-1,07	1,1427	
		≤ 10 nmol/mol (Span)	-1,640				
8b	Interferent Toluene with 0,5 µmol/mol	≤ 5.0 nmol/mol (Zero)	0,100	$u_{int,pos}$	0,79	0,6280	
		≤ 5.0 nmol/mol (Span)	0,970				
8c	Interferent Xylene with 0,5 µmol/mol	≤ 5.0 nmol/mol (Zero)	0,100	or			
		≤ 5.0 nmol/mol (Span)	0,940	$u_{int,\ neg}$			
9	Averaging effect	≤ 7.0% of meas. value	3,150	u_{av}	2,18	4,7628	
18	Difference sample/calibration port	≤ 1%	0,000	$u_{\Delta sc}$	0,00	0,0000	
21	Uncertainty of test gas	≤ 3%	2,000	u_{cg}	1,20	1,4400	

Combined standard uncertainty	u_c	3,6163	nmol/mol
Expanded uncertainty	U	7,2326	nmol/mol
Relative expanded uncertainty	W	6,03	%
Maximum allowed expanded uncertainty	W_{req}	15	%

Measuring device:	Thermo Fisher Scientific Model 49i					Serial number:	Gerät 1	
Measured component:	O3					1h-Alert threshold:	120	nmol/mol

No.	Performance characteristic	Performance criterion	Result	Partial uncertainty		Square of partial uncertainty	
1	Repeatability standard deviation at zero	≤ 1.0 nmol/mol	0,100	$u_{r,z}$	0,03	0,0007	
2	Repeatability standard deviation at 1h-limit value	≤ 3.0 nmol/mol	0,100	$u_{r,lh}$	not considered, as ur,lh = 0,02 < ur,f	-	
3	"lack of fit" at 1h-limit value	≤ 4.0% of meas. value	1,500	$u_{l,lh}$	1,04	1,0800	
4	Sensitivity coefficient of sample gas pressure at 1h-limit value	≤ 2.0 nmol/mol/kPa	0,100	u_{gp}	1,04	1,0800	
5	Sensitivity coefficient of sample gas temperature at 1h-limit value	≤ 1.0 nmol/mol/K	0,054	u_{gt}	0,56	0,3149	
6	Sensitivity coefficient of surrounding temperature at 1h-limit value	≤ 1.0 nmol/mol/K	-0,230	u_{st}	-1,59	2,5392	
7	Sensitivity coefficient of electrical voltage at 1h-limit value	≤ 0.30 nmol/mol/V	0,020	u_V	0,30	0,0885	
8a	Interferent H_20 with 21 mmol/mol	≤ 10 nmol/mol (Zero)	-0,980	u_{H2O}	-1,07	1,1427	
		≤ 10 nmol/mol (Span)	-1,640				
8b	Interferent Toluene with 0.5 µmol/mol	≤ 5.0 nmol/mol (Zero)	0,100	$u_{int,pos}$	0,79	0,6280	
		≤ 5.0 nmol/mol (Span)	0,970				
8c	Interferent Xylene with 0.5 µmol/mol	≤ 5.0 nmol/mol (Zero)	0,100	or			
		≤ 5.0 nmol/mol (Span)	0,940	$u_{int,\ neg}$			
9	Averaging effect	≤ 7.0% of meas. value	3,150	u_{av}	2,18	4,7628	
10	Reproducibility standard deviation under field conditions	≤ 5.0% of 3 month average	0,826	$u_{r,f}$	0,99	0,9825	
11	Long term drift at zero level	≤ 5.0 nmol/mol	1,000	$u_{d,l,z}$	0,58	0,3333	
12	Long term drift at 1h-limit value	≤ 5.0% of max. of cert. range	1,450	$u_{d,l,lh}$	1,00	1,0092	
18	Difference sample/calibration port	≤ 1%	0,000	$u_{\Delta sc}$	0,00	0,0000	
21	Uncertainty of test gas	≤ 3%	2,000	u_{cg}	1,20	1,4400	

Combined standard uncertainty	u_c	3,9245	nmol/mol
Expanded uncertainty	U	7,8490	nmol/mol
Relative expanded uncertainty	W	6,54	%
Maximum allowed expanded uncertainty	W_{req}	15	%

Calculation of overall uncertainty (Device 2)

Measuring device:	Thermo Fisher Scientific Model 49i					Serial number:	Gerät 2	
Measured component:	O3					1h-Alert threshold:	120	nmol/mol

No.	Performance characteristic	Performance criterion	Result	Partial uncertainty		Square of partial uncertainty
1	Repeatability standard deviation at zero	≤ 1.0 nmol/mol	0,100	$u_{r,Z}$	0,03	0,0007
2	Repeatability standard deviation at 1h-limit value	≤ 3.0 nmol/mol	0,100	$u_{r,lv}$	0,03	0,0007
3	"lack of fit" at 1h-limit value	≤ 4.0% of meas. value	1,600	$u_{l,lv}$	1,11	1,2288
4	Sensitivity coefficient of sample gas pressure at 1h-limit value	≤ 2.0 nmol/mol/kPa	0,090	u_{gp}	0,94	0,8748
5	Sensitivity coefficient of sample gas temperature at 1h-limit value	≤ 1.0 nmol/mol/K	0,003	u_{gt}	0,03	0,0010
6	Sensitivity coefficient of surrounding temperature at 1h-limit value	≤ 1.0 nmol/mol/K	-0,290	u_{st}	-2,01	4,0368
7	Sensitivity coefficient of electrical voltage at 1h-limit value	≤ 0.30 nmol/mol/V	0,030	u_V	0,45	0,1992
8a	Interferent H_20 with 21 mmol/mol	≤ 10 nmol/mol (Zero)	-0,800	u_{H2O}	-0,99	0,9819
		≤ 10 nmol/mol (Span)	-1,570			
8b	Interferent Toluene with 0,5 µmol/mol	≤ 5.0 nmol/mol (Zero)	0,070	$u_{int,pos}$	0,43	0,1864
		≤ 5.0 nmol/mol (Span)	0,540	or		
8c	Interferent Xylene with 0,5 µmol/mol	≤ 5.0 nmol/mol (Zero)	0,040			
		≤ 5.0 nmol/mol (Span)	0,500	$u_{int,\ neg}$		
9	Averaging effect	≤ 7.0% of meas. value	3,760	u_{av}	2,61	6,7860
18	Difference sample/calibration port	≤ 1%	0,000	u_{Dsc}	0,00	0,0000
21	Uncertainty of test gas	≤ 3%	2,000	ucg	1,20	1,4400

Combined standard uncertainty	u_c	3,9669	nmol/mol
Expanded uncertainty	U	7,9338	nmol/mol
Relative expanded uncertainty	W	6,61	%
Maximum allowed expanded uncertainty	W_{req}	15	%

Measuring device:	Thermo Fisher Scientific Model 49i					Serial number:	Gerät 2	
Measured component:	O3					1h-Alert threshold:	120	nmol/mol

No.	Performance characteristic	Performance criterion	Result	Partial uncertainty		Square of partial uncertainty
1	Repeatability standard deviation at zero	≤ 1.0 nmol/mol	0,100	$u_{r,z}$	0,03	0,0007
2	Repeatability standard deviation at 1h-limit value	≤ 3.0 nmol/mol	0,100	$u_{r,lh}$	not considered, as ur,lh = 0,02 < ur,f	-
3	"lack of fit" at 1h-limit value	≤ 4.0% of meas. value	1,600	$u_{l,lh}$	1,11	1,2288
4	Sensitivity coefficient of sample gas pressure at 1h-limit value	≤ 2.0 nmol/mol/kPa	0,090	u_{gp}	0,94	0,8748
5	Sensitivity coefficient of sample gas temperature at 1h-limit value	≤ 1.0 nmol/mol/K	0,003	u_{gt}	0,03	0,0010
6	Sensitivity coefficient of surrounding temperature at 1h-limit value	≤ 1.0 nmol/mol/K	-0,290	u_{st}	-2,01	4,0368
7	Sensitivity coefficient of electrical voltage at 1h-limit value	≤ 0.30 nmol/mol/V	0,030	u_V	0,45	0,1992
8a	Interferent H_20 with 21 mmol/mol	≤ 10 nmol/mol (Zero)	-0,800	u_{H2O}	-0,99	0,9819
		≤ 10 nmol/mol (Span)	-1,570			
8b	Interferent Toluene with 0.5 µmol/mol	≤ 5.0 nmol/mol (Zero)	0,070	$u_{int,pos}$	0,43	0,1864
		≤ 5.0 nmol/mol (Span)	0,540	or		
8c	Interferent Xylene with 0.5 µmol/mol	≤ 5.0 nmol/mol (Zero)	0,040			
		≤ 5.0 nmol/mol (Span)	0,500	$u_{int,\ neg}$		
9	Averaging effect	≤ 7.0% of meas. value	3,760	u_{av}	2,61	6,7860
10	Reproducibility standard deviation under field conditions	≤ 5.0% of 3 month average	0,826	$u_{r,f}$	0,99	0,9825
11	Long term drift at zero level	≤ 5.0 nmol/mol	1,040	$u_{d,l,z}$	0,60	0,3605
12	Long term drift at 1h-limit value	≤ 5.0% of max. of cert. range	-1,480	$u_{d,l,lh}$	-1,03	1,0514
18	Difference sample/calibration port	≤ 1%	0,000	$u_{\Delta sc}$	0,00	0,0000
21	Uncertainty of test gas	≤ 3%	2,000	u_{cg}	1,20	1,4400

Combined standard uncertainty	u_c	4,2579	nmol/mol
Expanded uncertainty	U	8,5159	nmol/mol
Relative expanded uncertainty	W	7,10	%
Maximum allowed expanded uncertainty	W_{req}	15	%

AMBIENT GAS ANALYZER

Product Specifications

Thermo Scientific Model 49*i* Ozone Analyzer

UV photometric gas analyzer

The Thermo Scientific™ Model 49*i* Ozone Analyzer utilizes UV Photometric technology to measure the amount of ozone in the air from ppb levels up to 200ppm.

- Approved to meet the following standards: U.S. EPA , UK Environmental Agency and the European Union
- Ethernet connectivity for efficient remote access
- Enhanced user interface with one button programming and large display screen
- Flash memory for increased data storage and user downloadable software
- Enhanced electronics design optimizes product commonality

The Thermo Scientific Model 49*i* analyzer is a dual cell photometer, the concept adopted by the NIST for the national ozone standard.

Dual range and auto range are standard features of the Model 49*i* analyzer. Because the instrument has both sample and reference flowing at the same time, a response time of 20 seconds can be achieved.

Temperature and pressure correction are standard offerings. User settable alarm levels for concentration and for a wide variety of internal diagnostics are available from an easy to follow menu.

This state-of-the-art gas analyzer offers features such as an Ethernet port and flash memory for increased data storage and field upgradability.

Ethernet connectivity provides efficient remote access, allowing the user to download measurement information directly from the instrument without having to be on-site.

You can easily program short-cut keys to allow you to jump directly to frequently accessed functions, menus or screens. The large interface screen can display measurement information and status, while viewing menu and operational screens.

Thermo Scientific Model 49i Ozone Analyzer

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Thermo Scientific Model 49*i* Ozone Analyzer

Preset Ranges	0-0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50, 100 and 200 ppm 0-0.1, 0.2, 1, 2, 5, 10, 20, 50, 100, 200 and 400 mg/m^3
Custom Ranges	0-0.05 to 200 ppm 0-0.1 to 400 mg/m^3
Zero Noise	0.25 ppb RMS (60 second averaging time)
Lower Detectable Limit	0.50 ppb
Zero Drift *(24 hour)*	< 1.0 ppb
Span Drift	<1% full scale per month
Response Time	20 seconds (10 second lag time)
Precision	1.0 ppb
Linearity	+/-1% full scale
Sample Flow Rate	1-3 liters/min.
Operating Temperature	Performance specifications based on operation within 20°-30° C range (per U.S. EPA Guidelines). Instrument may be safely operated over the range of 0°-45° C.
Power Requirements	100 VAC, 115 VAC, 220-240 VAC +/-10% @ 150W
Size and Weight	16.75"(W) x 8.62"(H) x 23"(D), 55 lbs. 425 mm (W) x 219 mm (H) x 584 mm (D), 25 kg
Outputs	Selectable Voltage, RS232/RS485, TCP/IP, 10 Status Relays, and Power Fail Indication (standard). 0-20 or 4-20 mA Isolated Current Outout (optional)
Inputs	16 Digital Inputs (standard), 8 0-10 vdc Analog Inputs (optional)
Approvals and Certifications	US EPA Equivalent Method: EQOA-0880-047 MCerts Certified: MC070096/00 EN14626: 936/21203248/13 Report NF Certificate: 05/01

Ordering Information

Model 49*i* Ozone Analyzer
Choose from the following configurations/options to customize your own Model 49*i* analyzer

1. Voltage options:
A = 115 VAC 50/60 Hz (standard)
B = 220/240 VAC 50/60 Hz
J = 100 VAC 50/60 Hz

2. Internal zero / span:
1 = No sample/cal valve (standard)
2 = Internal sample/cal valve assembly
3 = Internal Ozonator setup (including sample/cal valve)

3. Zero Air Source
N = No Zero Air Source (standard)
Z = Zero Air Source (External Pump)

4. Optional I/O:
A = No optional I/O (standard)
C = I/O expansion board (4-20mA outputs - 6 channels, 0-10v inputs - 8 channels

5. Mounting hardware:
A = Bench mounting and Ears/Handles, EIA

Other options:

- Teflon particulate filer
- Rack mounts
- Rear extender
- Terminal Block Kit & Cable 37 pin
- Terminal Block Kit & Cable 25 pin
- Cable, DB37M to open end, 6' LG.
- Cable, DB37F to open end, 6' LG.
- Cable, DB25M to open end, 6' LG.
- Cable, RS232 Null Modem

Your Order Code: Model 49i - _ _ _ _ _

To maintain optimal product performance, you need immediate access to experts worldwide, as well as priority status when your air quality equipment needs repair or replacement. We offer comprehensive, flexible support solutions for all phases of the product life cycle. Through predictable, fixed-cost pricing, our services help protect the return on investment and total cost of ownership of your Thermo Scientific products.

For more information, visit our website at thermoscientific.com

This product is manufactured in a plant whose quality management system is ISO 9001 certified.

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TÜVRheinland®
Precisely Right.

CERTIFICATE

TUV Approved

Certificate number: 0000054060_00

Manufacturer:	Mega System s.r.l. Via Don Fracassi, 41 20010 Bareggio (MI) Italy
Product:	LIFETEK PMS and LIFETEK 100 PMS
Components:	PM_{10} & $PM_{2.5}$
Test Report:	936/21224744/A of 2016-12-01
Valid until:	2021-11-30

The LIFETEK PMS and LIFETEK 100 PMS
complies with the
European standard EN 12341:2014 (PM10 & PM2.5)
and can be used as a
Standard / Reference Low Volume Sampler

TÜVRheinland®
CERTIFIED

Tested AMS
Regular
Surveillance

www.tuv.com
ID 0000054060

Cologne, 2016-12-01

i.V. Dipl.-Ing. G. Baum

i.A. Dipl.-Chem. M. Kerpa

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TÜV Rheinland Energy GmbH
Am Grauen Stein
51105 Köln

Overview

In order to show compliance of LIFETEK PMS and LIFETEK 100 PMS to the requirements on standard samplers according to EN 12341:2014, the following test points have been investigated and assessed:

For PM10 and PM2.5 (EN 12341:2014):

- Geometrical design of the sampling inlets (Annex A)
- Sampling system components
- Sampling period
- Sample storage and transport
- Applicable QA- and QC procedure
- Guide: Demonstration of Equivalence of Ambient Air Monitoring Methods
- The test has been performed as follows:
  - Preparation of two complete LIFETEK PMS Systems and one LIFETEK 100 PMS System to TÜV Rheinland.
  - Verification of compliance with the standard for all above mentioned points with traceable measurements (geometric design, flow rate…).
  - Check of the efficiency of the ambient temperature compensation, with comparing the ambient and filter temperature at different ambient conditions (EN 12341:2014 stipulates a max. difference: 5°C) – this test was performed in the climate chamber.
  - Check, if the conditioning of the housing of the instrument can secure the required storage conditions for loaded filters at different ambient temperatures (EN 12341:2014 stipulates a temperature of 23°C or below) – this test was performed in the climate chamber.

Field of Application

The LIFETEK PMS and LIFETEK 100 PMS are suitable for continuous ambient air monitoring (stationary operation).

The LIFETEK PMS is approved for the ambient air temperature range of -20 to +50°C and the LIFETEK 100 PMS system is approved for the ambient temperature range of +5 to +40°C.

Description of the AMS tested

This certificate applies to automated measurement systems conforming to the following description:

The LIFETEK 100 PMS and LIFETEK 100 are automatic and sequential devices for dust monitoring on membrane filters. As the system is designed as a sequential system, a gravimetric weighing of the dusts on the filters is possible, and the filters can be used for additional analytic procedures such as the detection of heavy metals.

The LIFETEK 100 PMS and LIFETEK 100 consists of a sampling inlet (PM10 or PM2.5), inlet tubes, vacuum pump, a measuring device, a water cooling system and two filter magazines (loading and unloading device) for new and sampled filters.

LIFETEK PMS

The central unit of the LIFETEK PMS comprises all servo-mechanical parts as well as the measuring unit, and all electronic units and microprocessors for system operation, control, and monitoring. The pump and the water cooling are installed in the bottom part of the device. The operating panel and system display can be found on the front side and the inlet tube is installed to the upper side of the sampler. To load and unload the filters the device can be opened on the back to remove the storages easily.

LIFETEK 100 PMS

The central unit of the LIFETEK 100 PMS comprises all servo-mechanical parts as well as the measuring unit, and all electronic units and microprocessors for system operation, control, monitoring, the pump and the water cooling. The operating panel, system display and storages can be found on the front side behind the front plate and the inlet tube is installed to the upper side of the sampler.

To ensure a secure operation it is recommended the use of a LIFETEK PMS system with GSM module installed. Depending on the application the user needs to ensure that the water cooling is not set too low to avoid condensation on the sampled filters.

LIFETEK PMS

AMBIENTE

Campionatore sequenziale $PM_{10}/PM_{2,5}$

LIFETEK PMS è la centralina sequenziale sviluppata per il campionamento delle polveri sottili in ambienti OUTDOOR in conformità alla norma UNI EN 12341:2014.
Il sistema è compatto e facile da trasportare.
Può essere utilizzato in ambienti esterni grazie alla cabina in cui viene alloggiato l'intero sistema oppure all'interno di un mezzo mobile dotando la centralina di apposito sostegno per testa di prelievo.
Realizzata con materiali in grado di garantire un'adeguata protezione contro gli agenti atmosferici.
LIFETEK PMS è una centralina per il monitoraggio in continuo del particolato atmosferico mediante il metodo gravimetrico su membrana filtrante del diametro 47 mm. Il sistema di cambio sequenziale della membrana con un'autonomia di 16 filtri unitamente al controllo elettronico del flusso, consentono il monitoraggio in continuo senza il presidio dell'operatore; oltre a poter sostituire i filtri esposti senza dover interrompere il campionamento in corso.
Il sistema di ventilazione della rampa di prelievo garantisce una differenza di temperatura tra filtro e punto di prelievo non superiore a 5 °C come richiesto dalla vigente normativa.
Il percorso rettilineo del tubo di aspirazione e la separazione della zona di permanenza dei filtri da fonti di calore interne o radianti, consentono di raccogliere e mantenere l'integrità dei campioni.
L'intero sistema è stato ingegnerizzato con il fine di eliminare tutte le possibili cause di inceppamento nel carico dei filtri. Pertanto il carico dei filtri avviene per gravità (caduta dall'alto verso il basso) e non per mezzo di un compressore che li spinge.
La pompa lavora sull'effettiva potenza necessaria per campionare e non al massimo delle sue possibilità così da garantire una durata maggiore delle palette incidendo notevolmente sui costi di assistenza.
La pompa inoltre è completamente insonorizzata; questo permette di poter utilizzare la centralina anche in ambienti urbani residenziali dov'è fondamentale avere un basso rumore di fondo, per non disturbare la quiete nelle ore notturne.
Il sistema di campionamento è predisposto per l'installazione di un modem GSM per la gestione in remoto del prelievo e degli allarmi tramite l'invio di SMS.

Un sistema di condizionamento e riscaldamento termoregolato permette di utilizzare la cabina in condizioni ambientali estreme senza compromettere le componenti elettroniche e garantendo la conservazione dei filtri campionati ad una temperatura controllata inferiore ai 23 °C (UNI EN 12341:2014 – punto 5.1.8)

ISO 9001 - Cert. n° 4466

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LIFETEK PMS

AMBIENTE

Campionatore sequenziale $PM_{10}/PM_{2,5}$

Il sistema sequenziale può essere dotato anche di sensori per la rilevazione dei parametri meteorologici (velocità e direzione vento, umidità, ecc) o interfacciarlo con una centralina meteo esistente acquisendo i relativi valori.
La modularità delle teste di prelievo consente di utilizzare il sistema anche con teste USEPA 40, CFR Part 50.
La centralina può essere dotata anche di interfaccia opzionale per la connessione di un sistema di elettro-valvole esterne (SELECT 8) per poter campionare le polveri totali (PTS) con autonomia di 8 o 16 filtri.

Lo strumento viene fornito completo di rapporto di prova.

Nota: Il rapporto di prova contiene anche la procedura di taratura utilizzata e l'indicazione degli standard primari di riferimento. Gli standard primari utilizzati sono certificati da Centri LAT o da Centri di Taratura internazionali accreditati da organismi membri della E.A. – European co-operation for Accreditation (associazione che rappresenta gli organismi di accreditamento europei)

Caratteristiche principali:

- portata costante con compensazione automatica delle perdite di carico
- sistema elettronico per la regolazione della portata che permette l'aggiornamento in tempo reale del flusso di campionamento e garantisce una portata volumetrica costante di 2,3 m3/h nella zona di prelievo dove avviene la separazione granulometrica in modo tale da mantenere costante la velocità dell'aria all'ingresso dei frazionatori
- tastiera e display LCD per la programmazione e la visualizzazione dei dati
- impostazione del flusso digitale per mezzo della tastiera
- registrazione e visualizzazione della temperatura e del volume campionato
- segnalazione, memorizzazione e gestione degli allarmi anche tramite modulo GSM (OPZIONALE)
- sensori dedicati per la rilevazione della temperatura (ambiente, filtro campionamento, filtri in stoccaggio, al contatore) e della pressione ambiente (barometrica), della perdita di carico sulla linea di prelievo
- memoria permanente per l'archiviazione dei dati relativi ai campionamenti
- batteria "tampone" per il riavvio del campionatore in caso di mancanza rete e la registrazione dell'evento stesso
- campionamenti ambientali a portata costante: PTS, PM10, PM2,5 e PM1 in conformità alla normative europee e americane
- interfaccia RS232 per lo scarico a PC dei dati memorizzati
- interfaccia USB per lo scarico dati su chiavetta (anche a campionamento in corso)

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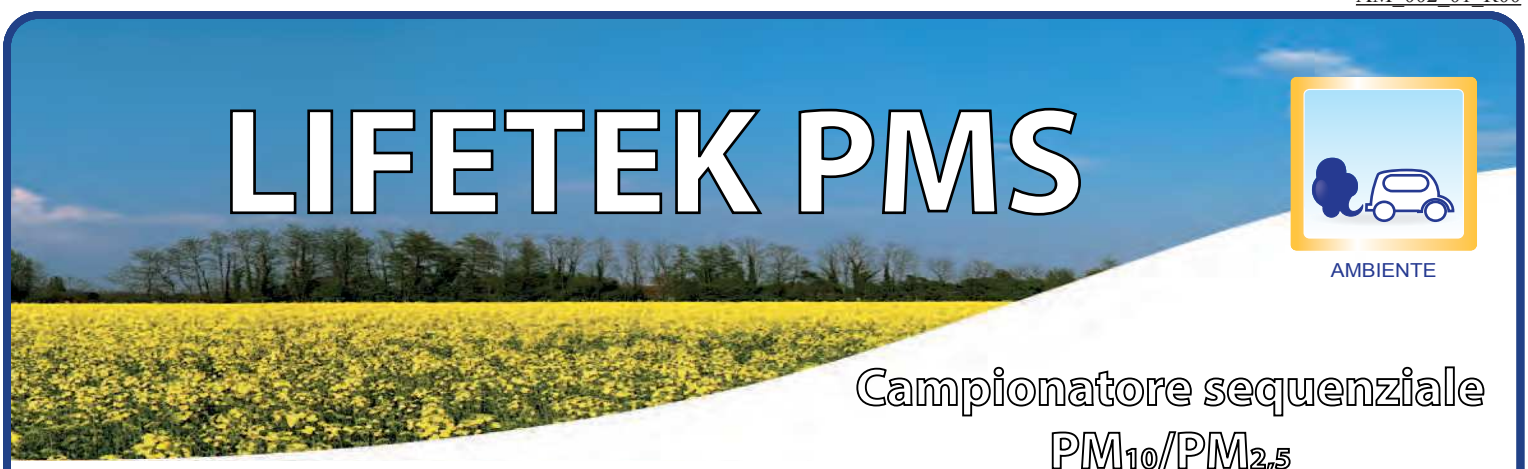
MEGA SYSTEM s.r.l.



LIFETEK PMS

AMBIENTE

Campionatore sequenziale $PM_{10}/PM_{2,5}$

POMPA	Pompa rotativa a palette da 6m3/h ad elevata prevalenza: > 600 mmHg
RANGE OPERATIVO	5 ÷ 70 l/min
CONTATORE VOLUMETRICO	contatore volumetrico a secco non azzerabile
	errore max: ± 2%
SENSORE TEMPERATURA CONTATORE	sensore temperatura: digitale
	range: 0 ÷ 50 °C
	risoluzione: 0,1 °C
	precisione: ± 2 °C
	linearità: ± 2 °C (linearizzazione software)
SENSORE TEMPERATURA AMBIENTE	sensore temperatura: digitale
	range: -10 ÷ 50 °C
	risoluzione: 0,1 °C
	precisione: ± 2 °C
	linearità: ± 2 °C (linearizzazione software)
SENSORE TEMPERATURA FILTRO	sensore temperatura: digitale
	range: -10 ÷ 50 °C
	risoluzione: 0,1 °C
	precisione: ± 2 °C
	linearità: ± 2 °C (linearizzazione software)
SENSORE TEMPERATURA FILTRI IN STOCCAGGIO	sensore temperatura: digitale
	range: -10 ÷ 50 °C
	risoluzione: 0,1 °C
	precisione: ± 2 °C
	linearità: ± 2 °C (linearizzazione software)
SENSORE VUOTO	range: 0 ÷ 760 mmHg
	risoluzione: 1 mmHg
	precisione: ± 5mmHg
SENSORE PRESSIONE BAROMETRICA	range: 800 ÷ 1100 mbar
	risoluzione: 0,1 mbar
	precisione: ± 1 mbar
TEMPERATURA DI UTILIZZO	-10°C ÷ +40°C 95% UR
GRADO DI PROTEZIONE	IP55
POTENZA ACUSTICA	LW 70,6 Db (A)
ALIMENTAZIONE	230 Vac - 50 Hz
DIMENSIONI	1225 (testa compresa) x 460 x 540 mm
PESO	59 Kg

ISO 9001 - Cert. n° 4466

Mega System Srl - Via Don Fracassi, 41 - 20010 Bareggio (Mi)
Phone: +39 02.90361622 - Fax: +39 02.90366880
Email: info@megasystemsrl.com - Web: www.megasystemsrl.com

MEGA SYSTEM s.r.l.

Umwelt Bundes Amt
For our Environment

TÜVRheinland®
Precisely Right.

CERTIFICATE

on Product Conformity (QAL1)

Number of Certificate: 0000037053

Certified AMS:	TEOM 1405-DF Ambient Particulate Monitor with PM_{10}-pre-separator and virtual impactor for particulate matter PM_{10} and $PM_{2,5}$
Manufacturer:	Thermo Fisher Scientific 27 Forge Parkway Franklin, MA 02038 USA
Test Institute:	TÜV Rheinland Energie und Umwelt GmbH

This is to certify that the AMS has been tested and found to comply with:

VDI 4202-1: 2010; VDI 4203-3: 2010, EN 12341: 1998; EN 14907: 2005; Guide on Demonstration of Equivalence of Ambient Air Monitoring Methods: 2010, EN 15267-1: 2009, EN 15267-2: 2009

Certification is awarded in respect of the conditions stated in this certificate (also see the following pages).

www.tuv.com TÜVRheinland® ID: 0000037053

- Certified equivalent EN method
- Complying with 2008/50/EC
- TUV approved
- Annual inspection

Publication in the German Federal Gazette (BAnz.) of 20 July 2012

Umweltbundesamt
Dessau, 20 August 2012

i. A. Marion Wichmann-Fiebig

The certificate is valid until:
19 July 2017

TÜV Rheinland Energie und Umwelt GmbH
Köln, 17 August 2012

ppa. Dr. Peter Wilbring

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teu@umwelt-tuv.de
Tel. +49 221 806-2756

TÜV Rheinland Energie und Umwelt GmbH
Am Grauen Stein
51105 Köln

Accreditation according to EN ISO/IEC 17025 and certified according to ISO 9001:2008.

10/221 2.08

Test report:	936/21209885/A of 11 March 2012
First certification:	20 July 2012
Validity ends:	19 July 2017
Publication:	BAnz AT 20 July 2012 B11, chapter III, No. 2.1

Approved application
The certified AMS is suitable for continuous ambient air monitoring (stationary operation).

The suitability of the product for this application was assessed on the basis of a laboratory test and a field test for four different test sites or time periods respectively.

The AMS is approved for a temperature range of +8 °C to +25 °C.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for ambient air applications at which it will be installed.

Basis of the certification
This certification is based on:

- test report 936/21209885/A of 11 March 2012 of TÜV Rheinland Energie und Umwelt GmbH
- suitability announced by the German Environmental Agency (UBA) as the relevant body
- the ongoing surveillance of the product and the manufacturing process
- publication in the German Federal Gazette: BAnz AT 20 July 2012 B11, chapter III, No. 2.1

AMS name:
TEOM 1405-DF Ambient Particulate Monitor with PM_{10}-pre-separator and virtual impactor for particulate matter PM_{10} and $PM_{2,5}$

Manufacturer:
Thermo Fisher Scientific, Franklin, USA

Approval:
For the continuous and parallel measurement of suspended particulate matter of the PM_{10}- and $PM_{2.5}$-fraction in ambient air (stationary operation)

Measuring ranges during the suitability test:

Component	Certification range	Unit
PM_{10}	0 – 1000	µg/m³
$PM_{2,5}$	0 – 1000	µg/m³

Software version:
1.56

Restriction:
The permissible range of ambient temperature at the site of installation for the measuring system is 8 °C to 25 °C.

Remarks:
1. Requirements for the variation coefficient R^2 according to the EN 12341 standard were not met at the Teddington site.
2. The reference equivalence function for the Teddington site is outside the bounds of the acceptance envelope as laid down in standard EN 12341.
3. Requirements according to the guide “Demonstration of Equivalence of Ambient Air Monitoring Methods” are met for the components PM_{10} and $PM_{2.5}$.
4. The measuring system shall be calibrated on site regularly using a gravimetric PM_{10}-reference method in accordance with DIN EN 12341.
5. The measuring system shall be calibrated on site regularly using a $PM_{2.5}$-reference method in accordance with DIN EN 14907.
6. The test report on the suitability test is available on the Internet: www.qal1.de.

Test report:
TÜV Rheinland Energie und Umwelt GmbH, Köln
Report No.: 936/21209885/A of 11 March 2012

Certified product
This certificate applies to automated measurement systems confirming to the following description:

The ambient air measuring system TEOM 1405-DF Ambient Particulate Monitor is based on the measuring principle of oscillating micro weighing.

For the weighing principle, which is used in the TEOM mass transducer in the measuring system TEOM 1405-DF Ambient Particulate Monitor, the change in mass determined with the sensor, results from the measurement of the change in frequency of the tapered element.

The particle sample passes the PM_{10} pre-separator with a flow rate of 16.67 l/min (=1 m³/h). Subsequently, the PM_{10}-fraction is divided in a PM_{Coarse}-fraction (flow rate 1.67 l/min) and in a $PM_{2.5}$-fraction (flow rate 15 l/min) by a virtual impactor. Whilst the PM_{Coarse}-flow is directly heading to the measuring system, the flow of the $PM_{2.5}$-fraction is divided into two further sub-flows via a flow splitter – the $PM_{2.5}$-flow of 3 l/min and the bypass-flow of 12 l/min. The PM_{Coarse}-flow and the $PM_{2.5}$-flow are directed to the actual measuring system TEOM 1405-DF via the FDMS-unit and are secreted to the respective TEOM-filter (constantly heated at 30 °C) and the secreted mass of particles is quantified.

To take into account non-volatile as well as volatile particulate during the measuring, the FDMS technology is used. The FDMS-unit is placed between the flow-splitter and the measuring device TEOM 1405-DF in the so called FDMS-tower. The FDMS-unit compensated automatically the part of the semi-volatile particulate using a switching valve and two operation modi – the base mode and the reference mode.

Every six minutes the switching valve changes the sampling flow rate from base to reference mode. In the base mode the sampling is done on a straight way via a dryer directly to the mass measuring. In the reference mode the air flow is directed through a cooled filter after the dryer, to remove and restrain the non-volatile and volatile part of the particulate from the sample. During normal operation the temperature of the cooler is maintained at constantly 4 °C.

Based on the mass concentration measuring during the base- and reference-modi the FDMS-system updates every six minutes the 1h-average of the following results:

Base-MC	=	Particle concentration of the particle-loaded sampling flow.
Ref-MC	=	Particle concentration of the particle-free sampling flow after passing through the cooled filter.
MC	=	Base-MC adjusted for Ref-MC
		Base-mass-concentration (normally positive)
		reference-mass-concentration (negative, in case mass of the filter evaporates).

After the mass determination the sampling flows are directed over a mass flow rate regulator. To guarantee a constant sampling volume flow at the inlet, bearing in mind the ambient temperature and pressure, the volume flow control shall be operated in the mode „active/ actual“.

The tested measuring system consists of PM_{10}-sampling inlet, the virtual impactor, flow splitter, the respective sampling tubes, a tripod to support the sample, the measuring device TEOM 1405-DF incl. FDMS-tower, the vacuum pump with its respective power supply cord and cables as well as adapters, the hole in the roof incl. a flange and a manual in German/English.

The measuring device is operated via touch screen at the front of the device. The user can retrieve data and instrument information, change parameters as well as perform tests and controls of the functionality of the measuring device.

General notes

This certificate is based upon the equipment tested. The manufacturer is responsible for ensuring that on-going production complies with the requirements of the EN 15267. The manufacturer is required to maintain an approved quality management system controlling the manufacture of the certified product. Both the product and the quality management systems shall be subject to regular surveillance.

If a product of the current production does not conform to the certified product, TÜV Rheinland Energie und Umwelt GmbH must be notified at the given address on page 1.

A certification mark with an ID-Number that is specific to the certified product is presented on page 1 of this certificate. This can be applied to the product or used in publicity material for the certified product is presented on page 1 of this certificate.

This document as well as the certification mark remains property of TÜV Rheinland Energie und Umwelt GmbH. With revocation of the publication the certificate looses its validity. After the expiration of the validity of the certificate and on requests of the TÜV Rheinland Energie und Umwelt GmbH this document shall be returned and the certificate mark must not be employed anymore.

The relevant version of this certificate and the validity is also accessible on theliternet Address: **qal1.de**.

Certification of TEOM 1405-DF Ambient Particulate Monitor with PM_{10}-pre-separator and virtual impactor for particulate matter PM_{10} and $PM_{2,5}$ is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Initial certification according to EN 15267

Certificate No. 0000037053: 20 August 2012

Validity of the certificate: 19 July 2017

Test report: 936/21209885/A of 11 March 2012
TÜV Rheinland Energie und Umwelt GmbH, Köln

Publication: BAnz AT 20 July 2012 B11, chapter III, No. 2.1
Announcement by UBA from 06 July 2012

PM10 1405DF FDMS	25,3% > 28 µg m-3	Orthogonal Regression				Between Instrument Uncertainties	
	W_{CM} / %	n_{c-s}	r^2	Slope (b) +/- u_b	Intercept (a) +/- u_a	Reference	Candidate
All Data	11.2	336	0.976	1.016 +/- 0.009	1.078 +/- 0.224	0.56	0.75
< 30 µg m-3	13.4	260	0.916	1.042 +/- 0.019	0.706 +/- 0.327	0.55	0.68
> 30 µg m-3	13.3	76	0.945	1.026 +/- 0.028	0.453 +/- 1.239	0.60	1.06

SN 20014	Dataset	Orthogonal Regression				Limit Value of 50 µg m-3	
		n_{c-s}	r^2	Slope (b) +/- u_b	Intercept (a) +/- u_a	W_{CM} / %	% > 28 µg m-3
Individual Datasets	Bornheim Winter	63	0.993	1.057 +/- 0.011	1.154 +/- 0.313	16.83	38.1
	Cologne Winter	74	0.985	1.027 +/- 0.015	0.575 +/- 0.523	10.60	55.4
	Bornheim Summer	75	0.977	1.109 +/- 0.020	-0.348 +/- 0.406	21.44	10.7
	Teddington	124	0.930	0.875 +/- 0.021	3.180 +/- 0.442	15.35	9.7
Combined Datasets	< 30 µg m-3	260	0.908	1.043 +/- 0.020	0.709 +/- 0.342	13.85	3.5
	> 30 µg m-3	76	0.935	1.042 +/- 0.031	-0.144 +/- 1.376	14.94	100.0
	All Data	336	0.973	1.021 +/- 0.009	1.010 +/- 0.241	12.15	25.3

SN 20116	Dataset	Orthogonal Regression				Limit Value of 50 µg m-3	
		n_{c-s}	r^2	Slope (b) +/- u_b	Intercept (a) +/- u_a	W_{CM} / %	% > 28 µg m-3
Individual Datasets	Bornheim Winter	65	0.993	1.032 +/- 0.011	0.921 +/- 0.301	11.13	36.9
	Cologne Winter	74	0.988	1.023 +/- 0.013	0.671 +/- 0.465	9.60	55.4
	Bornheim Summer	75	0.974	1.113 +/- 0.021	0.011 +/- 0.438	23.77	10.7
	Teddington	124	0.942	0.896 +/- 0.020	2.751 +/- 0.410	13.01	9.7
Combined Datasets	< 30 µg m-3	262	0.914	1.047 +/- 0.019	0.603 +/- 0.330	13.91	3.4
	> 30 µg m-3	76	0.950	1.014 +/- 0.026	0.880 +/- 0.176	12.43	100.0
	All Data	338	0.976	1.013 +/- 0.008	1.105 +/- 0.221	10.75	25.1

PM2.5 1405DF FDMS	30,2% > 17 µg m-3	Orthogonal Regression				Between Instrument Uncertainties	
	W_{CM} / %	n_{c-s}	r^2	Slope (b) +/- u_b	Intercept (a) +/- u_a	Reference	Candidate
All Data	14.0	338	0.976	0.997 +/- 0.008	1.212 +/- 0.163	0.55	0.76
< 18 µg m-3	23.8	247	0.892	1.094 +/- 0.023	0.426 +/- 0.235	0.54	0.64
> 18 µg m-3	17.0	91	0.955	1.015 +/- 0.023	0.330 +/- 0.748	0.56	1.05

SN 20014	Dataset	Orthogonal Regression				Limit Value of 30 µg m-3	
		n_{c-s}	r^2	Slope (b) +/- u_b	Intercept (a) +/- u_a	W_{CM} / %	% > 17 µg m-3
Individual Datasets	Bornheim Winter	61	0.990	1.055 +/- 0.014	1.110 +/- 0.307	20.49	42.6
	Cologne Winter	71	0.983	1.029 +/- 0.016	0.883 +/- 0.406	16.06	59.2
	Bornheim Summer	81	0.972	1.080 +/- 0.020	0.848 +/- 0.295	23.71	18.5
	Teddington	125	0.957	0.851 +/- 0.016	2.791 +/- 0.254	15.74	15.2
Combined Datasets	< 18 µg m-3	247	0.872	1.086 +/- 0.025	0.722 +/- 0.254	24.38	4.5
	> 18 µg m-3	91	0.948	1.029 +/- 0.025	0.336 +/- 0.819	19.57	100.0
	All Data	338	0.972	1.006 +/- 0.009	1.352 +/- 0.176	16.38	30.2

SN 20116	Dataset	Orthogonal Regression				Limit Value of 30 µg m-3	
		n_{c-s}	r^2	Slope (b) +/- u_b	Intercept (a) +/- u_a	W_{CM} / %	% > 17 µg m-3
Individual Datasets	Bornheim Winter	64	0.992	1.028 +/- 0.012	0.351 +/- 0.259	10.99	40.6
	Cologne Winter	71	0.982	1.003 +/- 0.016	0.971 +/- 0.408	13.17	59.2
	Bornheim Summer	81	0.972	1.084 +/- 0.020	0.410 +/- 0.294	21.90	18.5
	Teddington	125	0.968	0.861 +/- 0.014	2.317 +/- 0.219	15.55	15.2
Combined Datasets	< 18 µg m-3	250	0.899	1.112 +/- 0.022	0.037 +/- 0.229	24.63	4.4
	> 18 µg m-3	91	0.958	1.005 +/- 0.022	0.237 +/- 0.717	15.71	100.0
	All Data	341	0.977	0.991 +/- 0.008	1.040 +/- 0.158	12.49	29.9

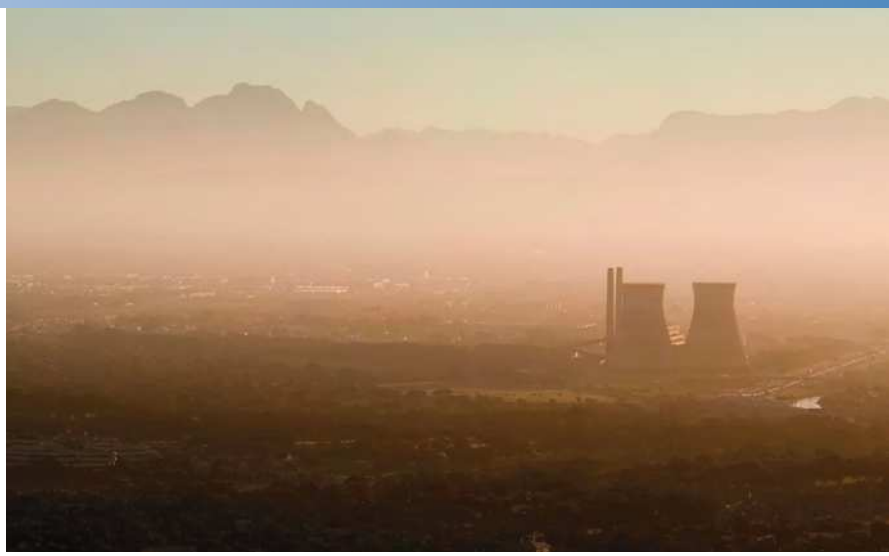
Thermo Scientific TEOM 1405-DF Ambient Particulate Monitor

Continuous dichotomous ambient air monitor

The Thermo Scientific™ TEOM 1405-DF Ambient Particulate Monitor simultaneously measures PM-10, PM-2.5 and PM-Coarse mass concentration as it exists in the ambient air.

- U.S. EPA PM-2.5 Equivalent Monitor (EQPM-0609-182)
- Accounts for volatile and non-volatile PM fractions
- Combines control unit, mass sensor and FDMS into a single integrated unit
- Embedded FTP server, Ethernet, USB, RS-232 and RS485 communications
- Activol flow control

*Candidate for PM-10 & PM-Coarse Equivalent Monitor



The 1405-DF monitor is composed of two Filter Dynamics Measurement Systems (FDMS) and two TEOM mass sensors housed in a single cabinet, network-ready configuration that includes the control system with touch screen user interface.

The TEOM 1405-DF system is designed to provide representative short and long term reading of the ambient PM concentration, even in the presence of volatile materials. Conventional PM monitoring approaches do not account for the rapid loss that can occur with collection on a filter while sampling ambient PM. The 1405-DF monitor overcomes this challenge by automatically generating mass concentration measurements (µg/m3) that account for both non-volatile and volatile PM-10, PM-2.5 and PM-Coarse components. The system's default data output consists of a running 1-hour and 24-hour average mass concentration updated every 6 minutes and on the hour respectively. The monitor computes a 1-hour FDMS base and reference mass concentrations updated every 6 minutes.

Users can select additional averaging times from 30 minutes to 23 hours.

The 1405-DF monitor provides a self-referencing, NIST-traceable true mass measurement using our own proven high reliability TEOM technology. The system differentiates itself from other PM measurement methods by utilizing a direct mass measurement that is not subject to measurement uncertainties found in surrogate techniques such as beta attenuation, light scattering and pressure drop.

Thermo SCIENTIFIC

Thermo Scientific TEOM 1405-DF Ambient Particulate Monitor

Standard System Configuration	Menu-driven software for user interaction via 1/4 VGA display with touch screen, connecting and Interface cables, and vacuum pump, consumables for average first year's operation (ambient), RPCOMM and ePort software for local or remote communication
Instrument Performance	Measurement Range: 0 to 1,000,000 µg/m³ (1 g/m³), resolution: 0.1 µg/m³, precision: ±2.0 µg/m³ (1-hour avg),
(3 l/min, 1s, stable conditions)	±1.0 µg/m³ (24-hour avg), accuracy for mass measurement: ±0.75%
Data Averaging and Output	Real-time mass conc average: 1 hour rolling average updated every six minutes, long-term averaging: 1, 8, and 24 hr, data output rate: selectable from 10 sec to 24 hour
Operating Range	The temperature of the sampled air may vary between -40° and 60 °C. The TEOM sensor and control units must be weather protected within the range of 8° to 25 °C. An optional complete outdoor enclosure provides complete weather protection.
Sample Flow	Activol flow control system uses the mass flow sensors and the measured ambient temperature and pressure to maintain constant volumetric flow rates. Main flow rate: Fine PM filter: 3.0 l/min; Coarse PM filter:1.67 l/min, bypass flow rate: 12.0 l/min
Data Storage	Internal data logging of user-specified variables; capacity of 500,000 records.
Filter Media	Sample filter: Pallflex TX40, 13 mm effective diameter, sample conditioner filter: 47mm diameter housed in an FRM-style molded filter cassette, maintained at 4°C. Suitable for collecting and archiving time-integrated PM samples for subsequent laboratory analysis.
Sample Conditioning	Sample Equilibration System (SES) dryer lowers the main flow relative humidity and allows for mass transducer operation at 5°C over the peak air monitoring station temperature. Purge Filter Conditioner contains a heat exchanger that maintains the temperature of the main flow and particle filter at 4°C to efficiently filter the volatile and non-volatile PM in the sample.
Data Output and Input	ePort software to view and change system operation from PC, touch screen user interface, Ethernet with embedded FTP server, USB, RS232, RS485, 8 user-defined analog outputs (0-1 or 0-5 Vdc), 2 user-fefined contact closure alarm circuits, 4 averaged analog inputs (0-5 Vdc) with user-defined conversion to engineering units
Power Requirements	Instrument: 100-240 VAC, 440 VA, 47-63 Hz Pump: 120 VAC/60 Hz: 4.25 A; 240 VAC/50 Hz: 2.25 A
Dimensions	17" (43.2 cm) W x 19" (48.3 cm) D x 55" (140 cm) H
Weight	83 lbs (38 kg)
Safety/Electrical Designations	Designed to meet: CE: EN 61326:1997 + A1:1998 + A2:2001 + A3:2003, EN:61010-1, UL: 61010-1:2004, CSA: C22.2 No. 61010-1:2004, FCC: Part 15 Subpart B, Class B
Approvals and Certifications	U.S. EPA PM-2.5 Equivalent Monitor EQPM-0609-182 Candidate for U.S. EPA PM-10 and PM-Coarse Equivalent Monitor Candidate for TÜV PM-2.5 and PM-10 Equivalent Monitor

To maintain optimal product performance, you need immediate access to experts worldwide, as well as priority status when your air quality equipment needs repair or replacement. We offer comprehensive, flexible support solutions for all phases of the product life cycle. Through predictable, fixed-cost pricing, our services help protect the return on investment and total cost of ownership of your Thermo Scientific products.

For more information, visit our website at thermoscientific.com/air

This product is manufactured in a plant whose quality management system is ISO 9001 certified.

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Umwelt Bundesamt

TÜVRheinland®
Precisely Right.

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000040218

Certified AMS:	Model 43i for SO_2
Manufacturer:	Thermo Fisher Scientific 27 Forge Parkway Franklin, MA 02038 USA
Test Institute:	TÜV Rheinland Energie und Umwelt GmbH

This is to certify that the AMS has been tested and found to comply with:

VDI 4202-1: 2002, VDI 4203-2: 2004, EN 14212: 2012, EN 15267-1: 2009, EN 15267-2: 2009

Certification is awarded in respect of the conditions stated in this certificate (see also the following pages).

TÜVRheinland® CERTIFIED

Suitability Tested
Complying with
2008/50/EC
EN 15267
Regular
Surveillance

www.tuv.com
ID 0000040218

Publication in the German Federal Gazette (BAnz.) of 08 April 2006

This certificate will expire on:
31 March 2019

German Federal Environment Agency
Dessau, 29 April 2014

i. A. Dr. Marcel Langner

TÜV Rheinland Energie und Umwelt GmbH
Cologne, 28 April 2014

ppa. Dr. Peter Wilbring

www.umwelt-tuv.de / www.eco-tuv.com teu@umwelt-tuv.de Tel. +49 221 806-5200	TÜV Rheinland Energie und Umwelt GmbH Am Grauen Stein 51105 Cologne
Accreditation according to EN ISO/IEC 17025 and certified according to ISO 9001:2008.	

Umwelt Bundesamt

Certificate:
0000040218 / 29 April 2014

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Test report:	936/21203248/D1 of 07 July 2006 Addendum 936/21221382/C of 20 September 2013
Initial certification:	01 April 2014
Date of expiry:	31 March 2019
Publication:	BAnz AT 01 April 2014 B12, chapter VI, notification 23

Approved application
The certified AMS is suitable for continuous monitoring of SO_2 in ambient air.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a three-month field test.

The AMS is approved for a temperature range of 0 °C to +30 °C.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for ambient air applications at which it will be installed.

Basis of the certification
This certification is based on:

- test report 936/21203248/D1 of 07 July 2006 of TÜV Rheinland Immissionsschutz und Energiesysteme GmbH and Addendum 936/21221382/C of 20 September 2013 of TÜV Rheinland Energie und Umwelt GmbH
- suitability announced by the German Federal Environment Agency (UBA) as the relevant body
- the on-going surveillance of the product and the manufacturing process
- publication in the German Federal Gazette (BAnz. 14 October 2006, No. 194, p. 6715, chapter IV, No. 2.2, UBA publication from 12 September 2006)
- publication in the German Federal Gazette (BAnz. 20 April 2007, No. 75, p. 4139, chapter IV, notification 1 and 6, UBA publication from 12 April 2007)
- publication in the German Federal Gazette (BAnz. 03 September 2008, No. 133, p. 3242, chapter IV, notification 13, UBA publication from 12 August 2008)
- publication in the German Federal Gazette (BAnz. 25 August 2009, No. 125, p. 2929, chapter III, notification 17, UBA publication from 03 August 2009)
- publication in the German Federal Gazette (BAnz. 28 July 2010, No. 111, p. 2597, chapter III, notification 5, UBA publication from 12 July 2010)
- publication in the German Federal Gazette (BAnz. 29 July 2011, No. 113, p. 2725, chapter III, notification 19, UBA publication from 15 July 2011)
- publication in the German Federal Gazette (BAnz. AT 20 July 2012 B11, chapter IV, notification 24, UBA publication from 06 July 2012)
- publication in the German Federal Gazette (BAnz AT 01 April 2014 B12, chapter VI, notification 23, UBA publication from 27 February 2014)

AMS designation:
SO_2 analyzer Model 43i

Manufacturer:
Thermo Electron Corporation Franklin, USA
Distribution:
Thermo Electron Corporation, Erlangen

Field of application:
For continuous monitoring of sulphur dioxide in ambient air.

Measuring ranges during the performance test:
SO_2 0 - 700 µg/m³ und
0 - 1000 µg/m³

Software version:
V 01.03.00.083

Testing institute:
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne,
TÜV Rheinland Group
Bericht-Nr.: 936/21203248/D of 7 July 2006

1 Notification of the German Federal Environment Agency

The new name of Thermo Electron Corp., Franklin, USA is Thermo Fisher Scientific, Franklin, USA.

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme, 51101 Cologne, Germany, Dr. Peter Wilbring, dated 20th December 2006

6 Notification of announcements by the German Federal Environment Agency dated 21st February 2006 (BAnz. p. 2653) and 12th September 2006 (BAnz. p. 6715)

The measuring systems model 42i for nitrogen oxide, model 43i for sulphur dioxide, model 48i for carbon monoxide and model 49i for ozone, manufactured by Thermo Fisher Scientific, MA 02038, USA, are also manufactured and sold identically and to the same standards by MLU-Monitoring für Leben und Umwelt Ges.m.b.H., Mödling, Austria.

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme, 51101 Cologne, Germany, Dr. Peter Wilbring, dated 14th December 2006

13 Notification of announcement by the German Federal Environment Agency dated 12th September 2006 (BAnz. p. 6717)

The current software version of the ambient air measuring system 43i by Thermo Fisher Scientific is:

V 01.05.06 (105721-00)

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme dated 10th March 2008

17 Notification of announcement by the German Federal Environment Agency dated 12th September 2006 (BAnz. p. 6717)

The current software version of the ambient air measuring system 43i by Thermo Fisher Scientific is:

V 01.06.01 (108457-00)

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 1st April 2009

5 Notification of announcements by the German Federal Environment Agency dated 12th September 2006 (BAnz. p. 6717) and 3rd August 2009 (BAnz. p. 2936)

The ambient air measuring system model 43i by Thermo Fisher Scientific can now also be operated with a sample gas pump type PU1959-N86-3.07 manufactured by KNF.

Statement by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 23rd März 2010

19 Notification of announcements by the German Federal Environment Agency dated 12th September 2006 (BAnz. p. 6715, Chapter IV Number 2.2) and 12th July 2010 (BAnz. p. 2597, Chapter III 5th notification)

The current software version of the ambient air measuring system model 43i for SO_2 by Thermo Fisher Scientific is:

V 01.06.07 (110959-00)

Statement by TÜV Rheinland Energie und Umwelt GmbH dated 30th March 2011

24 Notification of announcements by the German Federal Environment Agency dated 12th September 2006 (BAnz. p. 6715, Chapter IV Number 2.2) and 15th July 2011 (BAnz. p. 2725, Chapter III 19th notification)

The current software version of the ambient air measuring system model 43i for SO_2 by Thermo Fisher Scientific is 01.06.08.

The ambient air measuring system model 43i for SO_2 by Thermo Fisher Scientific will be fitted with the type PU2737-N86 vacuum pump manufactured by KNF.

Statement by TÜV Rheinland Energie und Umwelt GmbH dated 20th March 2012

23 Notification of announcements by the German Federal Environment Agency dated 12th September 2006 (BAnz. p. 6717, Chapter II Number 2.2) and 6th July 2012 (BAnz. AT 20.07.2012 B11, Chapter IV 24th notification)

The measuring system model 43i for SO_2 by Thermo Fisher Scientific fulfils the requirements of Standard EN 14212 (November 2012). Furthermore, the manufacturing process and quality management system of the measuring system model 43i for SO_2 fulfil the requirements of EN 15267.

The test report of the performance test with report number 936/21203248/D1 as well as an addendum as an integral part of the test report with report number 936/21221382/C can be viewed on the internet at www.qal1.de.

The Hamamatsu 1P28HA-5 photomultiplier was withdrawn and replaced by the new Hamamatsu R11568-15 photomultiplier.

The Arcturus Bd. 101491-xx processor board was withdrawn and replaced by the new Arcturus Bd. 110570-xx processor board.

The current software version of the measuring system is:
V 02.00.00 (113419-00)

Statement by TÜV Rheinland Energie und Umwelt GmbH dated 2nd October 2013

Certified product
This certificate applies to automated measurement systems conforming to the following description:

The sample is drawn into the model 43i through the sample bulkhead. The sample flows through a hydrocarbon "kicker" which removes hydrocarbons from the sample by forcing the hydrocarbon molecules to permeate through the tube wall. The SO_2 molecules pass through the hydrocarbon "kicker" unaffected.

The sample flows into the fluorescence chamber, where pulsating UV light excites the SO_2 molecules. The condensing lens focuses the pulsating UV light into the minor assembly. The minor assembly contains four selective mirrors that reflect only the wavelength which excite SO_2 molecules.

As the excited SO_2 molecules decay to lower energy sates, they emit UV light that is proportional to the SO_2 concentration. The bandpass filter allows only the wavelength emitted by the excited SO_2 molecules to reach the photomultiplier tube (PMT). The PMT detects the UV light emission from the decaying SO_2 molecules. The photo detector, located at the back of the fluorescence chamber, continuously monitors the pulsating UV light source and is connected to a circuit that compensates for fluctuations in the lamp intensity.

As the sample leaves the optical chamber, it passes through a flow sensor, a capillary, and the "shell" side of the hydrocarbon kicker. The model 43i outputs the SO_2 concentration to the front panel display, the analog outputs, and also makes the data available over the serial or ethernet connection.

The function of the pulsed fluorescence analyser, model 43i, is based on the principle that SO_2 molecules absorb ultraviolet light (UV) and are excited on a certain wavelength and then reduce to a lower energy level, whereby they emit UV light on another wavelength. The following equation applies:

$$SO_2 + hv \rightarrow SO_2^* \rightarrow SO_2 + hv' \text{ (UV)}$$

In the first step, the SO_2 molecules are excited by the UV light. In the second step they return to their original condition under the emission of hv´. The intensity of the fluorescence radiation is proportional to the number of SO_2 molecules in the detection volume and thus proportional to SO_2 concentration.

The measuring principle complies with the standard reference method as stipulated in EN 14212.

General notes
This certificate is based upon the equipment tested. The manufacturer is responsible for ensuring that on-going production complies with the requirements of the EN 15267. The manufacturer is required to maintain an approved quality management system controlling the manufacture of the certified product. Both the product and the quality management systems shall be subject to regular surveillance.

If a product of the current production does not conform to the certified product, TÜV Rheinland Energie und Umwelt GmbH must be notified at the address given on page 1.

A certification mark with an ID-Number that is specific to the certified product is presented on page 1 of this certificate. This can be applied to the product or used in publicity material for the certified product is presented on page 1 of this certificate.

This document as well as the certification mark remains property of TÜV Rheinland Energie und Umwelt GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energie und Umwelt GmbH this document shall be returned and the certificate mark must not be employed anymore.

The relevant version of this certificate and the validity is also accessible on the internet: **qal1.de**.

Certification of Model 43i for SO_2 is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Initial test:

Test report: 936/21203248/D1 of 07 July 2006
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne

Publication: BAnz. 14 Oktober 2006, No. 194, p. 6715, chapter IV, No. 2.2
Announcement by UBA from 12 September 2006

Initial certification according to EN 15267:

Certificate No. 0000040219: 29 April 2014

Expiration date of the certificate: 31 March 2019

Test report: 936/21203248/D1 of 07 July 2006
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne

Addendum 936/21221382/C of 20 September 2013
TÜV Rheinland Energie und Umwelt GmbH, Cologne

Publication: BAnz AT 01 April 2014 B12, chapter VI, notification 23
Announcement by UBA from 27 February 2014

Notification:

Publication: BAnz. 20 April 2007, No. 75, p. 4139, chapter IV, notification 1 and 6
Announcement by UBA from 12 April 2007

Publication: BAnz. 03 September 2008, No. 133, p. 3242, chapter IV, notification 13
Announcement by UBA from 12 August 2008

Publication: BAnz. 25 August 2009, No. 125, p. 2929, chapter III, notification 17
Announcement by UBA from 03 August 2009

Publication: BAnz. 28 July 2010, No. 111, p. 2597, chapter III, notification 5
Announcement by UBA from 12 July 2010

Publication: BAnz. 29 July 2011, No. 113, p. 2725, chapter III, notification 19
Announcement by UBA from 15 July 2011

Publication: BAnz AT 20 July 2012 B11, chapter IV, notification 24
Announcement by UBA from 06 July 2012

Publication: BAnz AT 01 April 2014 B12, chapter VI, notification 23
Announcement by UBA from 27 February 2014

Calculation of overall uncertainty lab test (Device 1)

Measuring device:	Thermo Fisher Scientific Modell 43i		Serial-No.:	Device 1	
Measured component:	SO2		1h-limit value:	132	nmol/mol

No.	Performance characteristic	Performance criterion	Result	Partial uncertainty		Square of partial uncertainty	
1	Repeatability standard deviation at zero	≤ 1.0 nmol/mol	0.230	$u_{r,z}$	0.06	0.0041	
2	Repeatability standard deviation at 1h-limit value	≤ 3.0 nmol/mol	0.470	$u_{r,lh}$	0.13	0.0173	
3	"lack of fit" at 1h-limit value	≤ 4.0% of measured value	-0.400	$u_{l,lh}$	-0.30	0.0929	
4	Sensitivity coefficient of sample gas pressure at 1h-limit value	≤ 2.0 nmol/mol/kPa	0.040	u_{gp}	0.30	0.0929	
5	Sensitivity coefficient of sample gas temperature at 1h-limit value	≤ 1.0 nmol/mol/K	-0.080	u_{gt}	-0.71	0.5065	
6	Sensitivity coefficient of surrounding temperature at 1h-limit value	≤ 1.0 nmol/mol/K	0.188	u_{st}	1.67	2.7972	
7	Sensitivity coefficient of electrical voltage at 1h-limit value	≤ 0.30 nmol/mol/V	-0.020	u_V	-0.20	0.0411	
8a	Interferent H_20 with 21 mmol/mol	≤ 10 nmol/mol (Zero)	0.300	u_{H2O}	0.02	0.0005	
		≤ 10 nmol/mol (Span)	0.030				
8b	Interferent H_2S with 200 nmol/mol	≤ 5.0 nmol/mol (Zero)	1.130	$u_{int,pos}$	6.24	38.8800	
		≤ 5.0 nmol/mol (Span)	0.530				
8c	Interferent NH_3 with 200 nmol/mol	≤ 5.0 nmol/mol (Zero)	-0.600	or			
		≤ 5.0 nmol/mol (Span)	0.770				
8d	Interferent NO with 500 nmol/mol	≤ 5.0 nmol/mol (Zero)	0.100				
		≤ 5.0 nmol/mol (Span)	-0.230				
8e	Interferent NO_2 with 200 nmol/mol	≤ 5.0 nmol/mol (Zero)	2.770				
		≤ 5.0 nmol/mol (Span)	2.030				
8f	Interferent m-Xylene with 1 µmol/mol	≤ 10 nmol/mol (Zero)	7.400				
		≤ 10 nmol/mol (Span)	7.470	$u_{int,neg}$			
9	Averaging effect	≤ 7.0% of measured value	-3.300	u_{av}	-2.51	6.3249	
18	Difference sample/calibration port	≤ 1.0%	0.000	$u_{\Delta sc}$	0.00	0.0000	
21	Uncertainty of test gas	≤ 3.0%	2.000	u_{cg}	1.32	1.7424	

Combined standard uncertainty	u_c	7.1063	nmol/mol
Expanded uncertainty	U	14.2127	nmol/mol
Relative expanded uncertainty	W	10.77	%
Maximum allowed expanded uncertainty	W_{req}	15	%

Umwelt Bundesamt

Certificate: 0000040218 / 29 April 2014

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Calculation of overall uncertainty lab test (Device 2)

Measuring device:	Thermo Fisher Scientific Modell 43i		Serial-No.:	Device 2	
Measured component:	SO2		1h-limit value:	132	nmol/mol

No.	Performance characteristic	Performance criterion	Result	Partial uncertainty		Square of partial uncertainty	
1	Repeatability standard deviation at zero	≤ 1.0 nmol/mol	0.130	$u_{r,z}$	0.04	0.0014	
2	Repeatability standard deviation at 1h-limit value	≤ 3.0 nmol/mol	0.390	$u_{r,lh}$	0.11	0.0124	
3	"lack of fit" at 1h-limit value	≤ 4.0% of measured value	-0.400	$u_{l,lh}$	-0.30	0.0929	
4	Sensitivity coefficient of sample gas pressure at 1h-limit value	≤ 2.0 nmol/mol/kPa	0.050	u_{gp}	0.38	0.1452	
5	Sensitivity coefficient of sample gas temperature at 1h-limit value	≤ 1.0 nmol/mol/K	-0.210	u_{gt}	-1.87	3.4901	
6	Sensitivity coefficient of surrounding temperature at 1h-limit value	≤ 1.0 nmol/mol/K	0.256	u_{st}	2.28	5.1866	
7	Sensitivity coefficient of electrical voltage at 1h-limit value	≤ 0.30 nmol/mol/V	-0.020	u_V	-0.20	0.0411	
8a	Interferent H_20 with 21 mmol/mol	≤ 10 nmol/mol (Zero)	-0.470	u_{H2O}	0.02	0.0005	
		≤ 10 nmol/mol (Span)	0.030				
8b	Interferent H_2S with 200 nmol/mol	≤ 5.0 nmol/mol (Zero)	0.530	$u_{int,pos}$	6.62	43.8536	
		≤ 5.0 nmol/mol (Span)	1.230				
8c	Interferent NH_3 with 200 nmol/mol	≤ 5.0 nmol/mol (Zero)	-1.270				
		≤ 5.0 nmol/mol (Span)	0.200				
8d	Interferent NO with 500 nmol/mol	≤ 5.0 nmol/mol (Zero)	-0.230				
		≤ 5.0 nmol/mol (Span)	-0.400	or			
8e	Interferent NO_2 with 200 nmol/mol	≤ 5.0 nmol/mol (Zero)	2.130				
		≤ 5.0 nmol/mol (Span)	2.670				
8f	Interferent m-Xylene with 1 µmol/mol	≤ 10 nmol/mol (Zero)	7.570				
		≤ 10 nmol/mol (Span)	7.370	$u_{int,neg}$			
9	Averaging effect	≤ 7.0% of measured value	-3.560	u_{av}	-2.71	7.3608	
18	Difference sample/calibration port	≤ 1.0%	0.100	$u_{\Delta sc}$	0.13	0.0174	
21	Uncertainty of test gas	≤ 3.0%	2.000	u_{cg}	1.32	1.7424	

Combined standard uncertainty	u_c	7.8705	nmol/mol
Expanded uncertainty	U	15.7410	nmol/mol
Relative expanded uncertainty	W	11.92	%
Maximum allowed expanded uncertainty	W_{req}	15	%

Umwelt Bundesamt

Certificate:
0000040218 / 29 April 2014

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Calculation of overall uncertainty lab and field test (Device 1)

Measuring device:	Thermo Fisher Scientific Modell 43i			Serial-No.:	Device 1	
Measured component:	SO2			1h-limit value:	132	nmol/mol

No.	Performance characteristic	Performance criterion		Result	Partial uncertainty		Square of partial uncertainty
1	Repeatability standard deviation at zero	≤	1.0 nmol/mol	0.230	$u_{r,z}$	0.06	0.0041
2	Repeatability standard deviation at 1h-limit value	≤	3.0 nmol/mol	0.470	$u_{r,lh}$	not considered, as ur,lh = 0,13 < ur,f	-
3	"lack of fit" at 1h-limit value	≤	4.0% of measured value	-0.400	$u_{l,lh}$	-0.30	0.0929
4	Sensitivity coefficient of sample gas pressure at 1h-limit value	≤	2.0 nmol/mol/kPa	0.040	u_{gp}	0.30	0.0929
5	Sensitivity coefficient of sample gas temperature at 1h-limit value	≤	1.0 nmol/mol/K	-0.080	u_{gt}	-0.71	0.5065
6	Sensitivity coefficient of surrounding temperature at 1h-limit value	≤	1.0 nmol/mol/K	0.188	u_{st}	1.67	2.7972
7	Sensitivity coefficient of electrical voltage at 1h-limit value	≤	0.30 nmol/mol/V	-0.020	u_V	-0.20	0.0411
8a	Interferent H_20 with 21 mmol/mol	≤	10 nmol/mol (Zero)	0.300			
		≤	10 nmol/mol (Span)	0.030	u_{H2O}	0.02	0.0005
8b	Interferent H_2S with 200 nmol/mol	≤	5.0 nmol/mol (Zero)	1.130			
		≤	5.0 nmol/mol (Span)	0.530	$u_{int,pos}$		
8c	Interferent NH_3 with 200 nmol/mol	≤	5.0 nmol/mol (Zero)	-0.600			
		≤	5.0 nmol/mol (Span)	0.770			
8d	Interferent NO with 500 nmol/mol	≤	5.0 nmol/mol (Zero)	0.100			
		≤	5.0 nmol/mol (Span)	-0.230	or	6.24	38.8800
8e	Interferent NO_2 with 200 nmol/mol	≤	5.0 nmol/mol (Zero)	2.770			
		≤	5.0 nmol/mol (Span)	2.030			
8f	Interferent m-Xylene with 1 µmol/mol	≤	10 nmol/mol (Zero)	7.400			
		≤	10 nmol/mol (Span)	7.470	$u_{int,neg}$		
9	Averaging effect	≤	7.0% of measured value	-3.300	u_{av}	-2.51	6.3249
10	Reproducibility standard deviation under field conditions	≤	5.0% of average over 3 months	3.900	$u_{r,f}$	5.15	26.5019
11	Long term drift at zero level	≤	4.0 nmol/mol	0.340	$u_{d,l,z}$	0.20	0.0385
12	Long term drift at span level	≤	5.0% of max. of certification range	2.190	$u_{d,l,lh}$	1.67	2.7856
18	Difference sample/calibration port	≤	1.0%	0.000	$u_{\Delta sc}$	0.00	0.0000
21	Uncertainty of test gas	≤	3.0%	2.000	u_{cg}	1.32	1.7424

Combined standard uncertainty	u_c	8.9336	nmol/mol
Expanded uncertainty	U	17.8671	nmol/mol
Relative expanded uncertainty	W	13.54	%
Maximum allowed expanded uncertainty	W_{req}	15	%

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Calculation of overall uncertainty lab and field test (Device 2)

Measuring device:	Thermo Fisher Scientific Modell 43i			Serial-No.:	Device 2	
Measured component:	SO2			1h-limit value:	132	nmol/mol

No.	Performance characteristic	Performance criterion		Result	Partial uncertainty		Square of partial uncertainty	
1	Repeatability standard deviation at zero	≤	1.0 nmol/mol	0.130	$u_{r,z}$	0.04	0.0014	
2	Repeatability standard deviation at 1h-limit value	≤	3.0 nmol/mol	0.390	$u_{r,lh}$	not considered, as ur,lh = 0,11 < ur,f	-	
3	"lack of fit" at 1h-limit value	≤	4.0% of measured value	-0.400	$u_{l,lh}$	-0.30	0.0929	
4	Sensitivity coefficient of sample gas pressure at 1h-limit value	≤	2.0 nmol/mol/kPa	0.050	u_{gp}	0.38	0.1452	
5	Sensitivity coefficient of sample gas temperature at 1h-limit value	≤	1.0 nmol/mol/K	-0.210	u_{gt}	-1.87	3.4901	
6	Sensitivity coefficient of surrounding temperature at 1h-limit value	≤	1.0 nmol/mol/K	0.256	u_{st}	2.28	5.1866	
7	Sensitivity coefficient of electrical voltage at 1h-limit value	≤	0.30 nmol/mol/V	-0.020	u_V	-0.20	0.0411	
8a	Interferent H_20 with 21 mmol/mol	≤	10 nmol/mol (Zero)	-0.470				
		≤	10 nmol/mol (Span)	0.030	u_{H2O}	0.02	0.0005	
8b	Interferent H_2S with 200 nmol/mol	≤	5.0 nmol/mol (Zero)	0.530				
		≤	5.0 nmol/mol (Span)	1.230	$u_{int,pos}$			
8c	Interferent NH_3 with 200 nmol/mol	≤	5.0 nmol/mol (Zero)	-1.270				
		≤	5.0 nmol/mol (Span)	0.200				
8d	Interferent NO with 500 nmol/mol	≤	5.0 nmol/mol (Zero)	-0.230				
		≤	5.0 nmol/mol (Span)	-0.400	or	6.62	43.8536	
8e	Interferent NO_2 with 200 nmol/mol	≤	5.0 nmol/mol (Zero)	2.130				
		≤	5.0 nmol/mol (Span)	2.670				
8f	Interferent m-Xylene with 1 µmol/mol	≤	10 nmol/mol (Zero)	7.570				
		≤	10 nmol/mol (Span)	7.370	$u_{int,neg}$			
9	Averaging effect	≤	7.0% of measured value	-3.560	u_{av}	-2.71	7.3608	
10	Reproducibility standard deviation under field conditions	≤	5.0% of average over 3 months	3.900	$u_{r,f}$	5.15	26.5019	
11	Long term drift at zero level	≤	4.0 nmol/mol	0.340	$u_{d,l,z}$	0.20	0.0385	
12	Long term drift at span level	≤	5.0% of max. of certification range	2.700	$u_{d,l,lh}$	2.06	4.2340	
18	Difference sample/calibration port	≤	1.0%	0.100	$u_{\Delta sc}$	0.13	0.0174	
21	Uncertainty of test gas	≤	3.0%	2.000	u_{cg}	1.32	1.7424	

Combined standard uncertainty	u_c	9.6284	nmol/mol
Expanded uncertainty	U	19.2569	nmol/mol
Relative expanded uncertainty	W	14.59	%
Maximum allowed expanded uncertainty	W_{req}	15	%

Umwelt Bundesamt

Certificate:
0000040218 / 29 April 2014

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Thermo Scientific Model 43*i* Sulfur Dioxide Analyzer

Pulsed fluorescence gas analyzer

The Thermo Scientific™ Model 43*i* Sulfur Dioxide (SO_2) Analyzer utilizes pulsed fluorescence technology to measure the amount of sulfur dioxide in the air up to 100 ppm.

- Ethernet connectivity for efficient remote access
- Enhanced user interface with one button programming and large display screen
- Flash memory for increased data storage and user downloadable software
- Enhanced electronics design optimizes product commonality

The Thermo Scientific Model 43*i* Sulfur Dioxide (SO_2) Analyzer utilizes pulsed fluorescence technology to measure the amount of sulfur dioxide in the air up to 100 ppm.

The pulsing of the U.V. source lamp serves to increase the optical intensity whereby a greater U.V. energy throughput and lower detectable SO_2 concentration are realized.

Reflective bandpass filters, as compared to commonly used transmission filters, are less subject to photochemical degradation and more selective in wavelength isolation.

This results in both increased detection specificity and long term stability. The state-of-the-art gas analyzer offers features such as an Ethernet port as well as flash memory for increased data storage.

Ethernet connectivity provides efficient remote access, allowing the user to download measurement information directly from the instrument without having to be on-site.

Easily programmable short-cut keys allow you to jump directly to frequently accessed functions, menus or screens. The larger interface screen can display up to five lines of measurement information while the primary screen remains visible.

Thermo Scientific Model 43i Sulfur Dioxide Analyzer

Thermo SCIENTIFIC

Thermo Scientific Model 43*i* Sulfur Dioxide Analyzer

Preset Ranges	0-0.05, 0.1, 0.2, 0.5, 1, 2, 5, and 10 ppm, 0-0.2, 0.5, 1, 2, 5, 10, 20, and 25 mg/m^3
Extended Ranges	0-0.05, 1, 2, 5, 10, 20, 50 and 100 ppm, 0-2, 5, 10, 20, 50, 100, 200, and 250 mg/m^3
Custom Ranges	0-0.05 to 100 ppm, 0-0.2 to 250 mg/m^3
Zero Noise	1.0 ppb RMS (10 second averaging time), 0.5 ppb RMS (60 second averaging time), 0.25 ppb RMS (300 second averaging time)
Lower Detectable Limit	< 0.5 ppb
Zero Drift *(24 hour)*	Less than 1 ppb
Span Drift *(24 hour)*	+/-0.5%
Response Time	< 20 seconds (lag time) (60 second or less averaging time) < 100 seconds (rise time) < 100 seconds (fall time)
Precision	1% of reading or 1 ppb (whichever is greater)
Linearity	+/-1% full scale < 100ppm
Sample Flow Rate	0.5 liters/min. (standard) 1 liter/min. (optional)
Interferences	< lower detectable limit except for the following: (EPA Levels) NO < 3 ppb, M-Xylene < 1 ppb, H2O < 3% of reading
Temperature Range (Operating)	Performance specifications based on operation within 68°-86°F (20°C - 30°C) range (per U.S. EPA guidelines). Instrument may be safely operated over the range of 32°-113°F (0°-45°C).
Power Requirements	100 VAC, 115 VAC, 220-240 VAC +/-10% @ 165W
Size and Weight	16.75"(W) x 8.62"(H) x 23"(D), 48 lbs. (21.8 kg)
Outputs	Selectable voltage, RS232/RS485, TCP/IP, 10 status relays, and power fail Indication (standard). 0-20 or 4-20 mA isolated current output (optional)
Inputs	16 digital inputs (standard), 8 0-10Vdc analog inputs (optional)
Approvals and Certifications	US EPA Equivalent Method: EQSA-0486-060, MCERTS Certified: Sira MC070094/00 EN14212: TÜV 936/21203248/D Report

Ordering Information

Model 43*i* Sulfur Dioxide Analyzer
Choose from the following configurations/options to customize your own Model 43*i* analyzer

1. Voltage options:
A = 115 VAC 60 Hz
B = 220 VAC 50 Hz
J = 100 VAC 50/60 Hz

2. Internal zero / span:
N = No zero / span assembly (standard)
Z = Internal zero span assembly
P = Internal permeation span source w/ zero/span assembly
L = Oxygen Sensor with No Zero/Span
K = Oxygen Sensor with Zero/Span

3. Kicker Type:
S = Standard
H = Heated

4. Optional I/O:
A = None (standard)
C = 0-20, 4-20mA current output - 6 channels, 0-10v analog input - 8 channel

5. Mounting Hardware:
A = Bench mounting and Ears/ Handles, EIA

Your Order Code: 43i - _ _ _ _ _

To maintain optimal product performance, you need immediate access to experts worldwide, as well as priority status when your air quality equipment needs repair or replacement. We offer comprehensive, flexible support solutions for all phases of the product life cycle. Through predictable, fixed-cost pricing, our services help protect the return on investment and total cost of ownership of your Thermo Scientific products.

For more information, visit our website at thermoscientific.com

This product is manufactured in a plant whose quality management system is ISO 9001 certified.

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Thermo SCIENTIFIC
A Thermo Fisher Scientific Brand

Lit_43iEPM_0714

AirCube™ COM2 TH e COM2 ISO

- **Leggero compatto, peso non superiore a 8,0 Kg**
- **Flusso operativo compreso tra 0,2 e 30 litri/minuto con un unico range dinamico**
- **Nessuna necessità di adattatore per lavorare ai bassi flussi**
- **Pacco batterie ad elevata capacità in grado di garantire lunghi periodi di campionamento**
- **Pompa a singola testa a membrana**
- **Contatore volumetrico incorporato come richiesto dalle normative in vigore**
- **Lettura del flusso con Mass Flow Meter con integrazione del dato**
- **Conformità alle normative RoHs-2006 ed alla normativa UNI-EN.12919:2001**

Con il nuovo campionatore portatile AirCube™ COM2 TH si può considerare conclusa l'era dei campionamenti con lunghe ed interminabili impostazioni.
Con pochi passaggi nel facile menù di preparazione e si è subito pronti per un campionamento. polveri respirabili, fibre aerodisperse, polveri e gas tossici in emissione: il campionatore AirCube™ COM2 TH è la soluzione universale a tutte le esigenze di campionamento.
Il tempo dei by-pass manuali o di non accurati e poco pratici orifizi tarati per alti e bassi flussi è terminato. Basta impostare il flusso desiderato ed iniziare il campionamento!!!
Con il range di flusso compreso tra 0,1 e 30 litri per minuto in una unica scala dinamica, AirCube™ COM2 non ha rivali.
Il campionatore AirCube™ COM2 è il vero compatto della categoria con solo 24 cm per lato e 27 per altezza ma con all'interno il contatore volumetrico a secco come richiesto dalle più comuni normative vigenti.
Unico nel suo genere dotato di una pompa a membrana alimentabile a 12Vcc.
Elevato range di portata e compensazione delle perdite di carico superiore a 2200 mm/H_2O
Il campionatore a portata costante AirCube™ Com2 TH appartiene alla seconda generazione dell'affermata linea di campionatori portatili realizzati da Analitica Strumenti.
Nuovo per compattezza, più leggero con l'esclusiva valvola proporzionale per un'accurata regolazione del flusso di aspirazione.
Il campionatore AirCube™ Com2 TH è regolabile con flusso operativo compreso in un unico range dinamico tra 0,2 e 30 litri per minuto senza l'ausilio di valvole by-pass e senza l'utilizzo di regolatori particolari per operare nel campo dei bassi flussi. Unico nel suo genere, il campionatore AirCube™ Com2 TH è alimentabile con batterie ricaricabili e direttamente da rete elettrica senza l'utilizzo di alimentatori esterni.
La nuova scheda con display grafico ad alta risoluzione e retroilluminato consente una facile ed intuitiva impostazione dei dati ed una visualizzazione immediata durante le fasi operative di campionamento visualizzando in tempo reale tutti i dati riferiti ad esso come: flusso istantaneo e flusso medio del periodo, temperatura istantanea al contatore e media del periodo, temperatura ambiente istantanea e temperatura media del periodo, pressione barometrica atmosferica istantanea e media del periodo, volume parziale campionato, tempo di campionamento. Inoltre sempre da display è possibile seguire l'andamento del campionamento su grafico impostato sulla base flusso di aspirazione e tempo.
Questa opzione consente di verificare la validità del campionamento validando il dato con calcolo della deviazione standard.

Caratteristiche Tecniche

- Campo regolazione del flusso 0,2-30 litri minuto
- Flusso massimo di impiego 28 lit/minuto (testato con filtro Fiberfilm 47 mm 1800 mm/H_2O)
- Massima compensazione raggiungibile: 2200 mm/H_20
- Compensazione a controllo elettronico delle perdite di carico
- Pompa aspirante membrana singola testa
- Attenuatore di pulsazioni con controllo di pressione incorporato
- Regolazione automatica del flusso di aspirazione con valvola proporzionale brevettata
- Controllo del flusso con dispositivo Mass Flow Meter con letture istantanea ed integrata
- Impostazione del campionamento per tempi e volumi direttamente dalla tastiera
- Impostazione del flusso di campionamento da tastiera
- Rilevazione istantanea e calcolo della media per:

Temperatura al contatore

Temperatura ambiente

Pressione barometrica atmosferica

Flusso di aspirazione

Velocità e direzione del vento (a sensori

phone +39 0721 26243 | www.analiticastrumenti.com | fax +39 0721 26285 | info@analiticastrumenti.com

installati disponibili opzionali)

- Visualizzazione grafica dell'andamento del campionamento con calcolo della deviazione standard
- Possibilità di controllo remoto mediante scheda GSM/GPRS (Opzionale)
- Possibilità di gestione gruppo sequenziale con elettrovalvole per polveri e gas
- Volume totale rilevabile da contatore volumetrico integrato
- Possibilità di impostazione della temperatura di normalizzazione
- Scheda elettronica conforme ai requisiti dettati dalla normativa RoHS-2006
- Conforme alla normativa EN-12919:2001
- Possibilità di doppia alimentazione con batterie ricaricabili e con rete 220V senza utilizzo di alimentatori esterni.

Caratteristiche Fisiche

- Peso: 8 Kg.
- Dimensioni: 245x245x270 mm (LxPxH)
- Conformità CE sulla Compatibilità Elettromagnetica 89/336/CEE riferito alle normative EN 50081-1, EN 6111-6-2, EN 55014-1, EN 61326-1 ed EN 60204-1:1997-12 riguardante le prove strumentali di sicurezza elettrica
- Alimentazione

12Vcc con pacco batterie Power Pack Com (Opzionale 600/PP014A3COM2)

- Alimentazione da rete 220V/AC con cavo standard

Al campionatore portatile AirCube COM2-TH è possibile collegare i moduli da 8 posti per il campionamento sequenziale di polveri ed il nuovo dispositivo per campionamenti sequenziali di gas con l'ausilio di fiale adsorbenti GasCheck Basic.

Il campionatore portatile AirCube™ COM2 TH è disponibile anche nella versione ISO in grado di effettuare i campionamenti da camino con il calcolo e la regolazione dei flussi di aspirazione in tempo reale conforme ai requisiti delle normative attualmente in vigore. Il nuovo campionatore AirCube™ COM2 ISO è un unico strumento dalle dimensioni contenute è in grado di acquisire tutti i parametri presenti all'interno del camino regolando automaticamente le condizioni di campionamento.

AirCube™ COM2 ed accessori	codice
Campionatore AirCube™ Com2 TH	600/A30002C-TH
Campionatore AirCube™ Com2 ISO versione per Isocinetismo	600/A30002C-ISO
Power Pack Cube per AirCubeT Com2 con Carica Batterie	600/PP014A3COM2
Sensore pressione barometrica atmosferica	600/AFBAR01
Modulo sequenziale 8 posizioni per polveri con cavo	600/EV001P
Cavalletto di supporto per sequenziale tipo 190D	MT/190D
Gruppo sequenziale per fiale adsorbenti GasCheck Basic 12P	600/GCB12001K
Gruppo sensori meteo (velocità+direzione) con kit montaggio	600/GRMET001K
Modulo Interfaccia GSM (scheda SIM non fornibile)	600/AFPUF1001GSM
Software SDC 2000 per versioni Plus e Com2	600/OSW200
Cavalletto in alluminio tipo leggero	MT/001
Porta Membrana completo di cassetta 47 mm	600/PF4700

AirCube® COM2 Iso

Caratteristiche Tecniche
- Flusso 0,5-30 litri min.
- Range Pompa fino a 35 litri minuto
- Controllo volumetrico e normalizzazione mediante contatore a secco
- Controllo del flusso con sensore MassFlow AMS Analitica
- Compensazione elettronica delle perdite di carico
- Impostazione del flusso direttamente da tastiera
- Pompa ,a membrana singola testa
- Compensazione perdite di carico 500 mm/Hg, con controllo elettronico della pressione
- Peso 9 Kg
- Lettura litri totali mediante contatore volumetrico a secco e display
- Lettura del volume normalizzato a display
- Controllo temperatura a display con precisione 0,1°C
- Possibilità di impostazione della temperatura di normalizzazione
- Interfaccia di serie con gruppo sequenziale ad elettrovalvole per il campionamento di polveri totali TSP
- Interfaccia con gruppo sensori meteo (opzionale)
- Interfaccia RS 232 per scarico dati e parametri di campionamento
- Porta USB per scarico dati ed aggiornamenti software
- Controllo remoto con dispositivo GSM/GPRS (opzionale)
- Sistema raffreddamento forzato con cicli di ricambio ogni 5 secondi e dissipatore in alluminio
- Dimensioni 26x26x26 cm (LxPxH)
- Struttura esterna lega in alluminio verniciata con polveri epossidiche
- Rilevazione della pressione barometrica con sensore direttamente installato nel circuito
- Uscita dati RS 232 per collegamento PC o stampante seriale portatile
- Conforme alla normativa EN- 12919:2001 Conformità CE sulla Compatibilità Elettromagnetica 89/336/CEE riferito alle normative EN 50081-1, EN 6111-6-2, EN 55014-1, EN 61326-1 ed EN 60204-1:1997-12 riguardante le prove strumentali di sicurezza elettrica

CAMPIONATORE D'ARIA MOD.CF 20

Il ***CF 20alfa Basic*** é uno strumento ideale di lavoro per tutti gli operatori che richiedono da un campionatore affidabilità e precisione di misura, unita a maneggevolezza e versatilità di funzionamento. Con tale apparecchio é possibile operare campionamenti di polveri e gas, in accoppiamento con i più svariati accessori disegnati nel rispetto delle attuali normative.

- ***Chassis:*** parte frontale e spalle in poliuretano ad alta densità
  parte posteriore in alluminio
  spigoli arrotondati

(La carrozzeria in poliuretano e alluminio evita la formazione di ruggine e rende la strumentazione più leggera e gradevole. L'eliminazione di spigoli vivi assicura il pieno rispetto delle normative vigenti)

- Consolle di comando protetta da un ***pannello in plexiglass*** traspartente con chiusura tramite lucchetto
- ***Tipo di pompa:*** a membrana a doppia testa
- ***Range di portata:*** 0,25 ÷ 40 l/min a bocca libera (27 l/min con filtro 0,8 μm)
- ***Prevalenza della pompa:*** 640 mm Hg
- ***Attivazione del campionamento:*** tramite timer di programmazione che permette l'impostazione delle seguenti funzioni:
- ora corrente
- ora di inizio e fine campionamento
- impostazione fino a 8 cicli di campionamento
- "ora legale"
- possibilità di attivazione e disattivazione manuale del campionamento
- ***Misura della portata:*** tramite 2 flussimetri di precisione
- ***Misura del volume:*** tramite contatore volumetrico a secco e contatore parziale su display LCD con chiave di sicurezza per azzeramento e bloccaggio
- ***Risoluzione contatore volumetrico:*** 0,2 litri
- ***Misura della temperatura:*** tramite termoelemento con visualizzazione a display del valore istantaneo
- ***Misura del vuoto:*** tramite vacuometro incorporato (permette la verifica della tenuta della linea pneumatica e del progressivo intasamento dei supporti utilizzati)
- ***Scaricatore di condensa*** posto nella parte posteriore dello strumento
- ***Alimentazione:*** a rete 220 V 50 Hz
- ***Dimensioni:*** 40 (h) x 35 (p) x 31,5 (l) cm
- ***Peso:*** 12,7 kg

Lo strumento viene fornito con una comoda maniglia rimovibile in tela plastificata

Il campionatore è conforme alla norma UNI EN 12919.

AMS Analitica
Air Monitoring Systems

AMS Analitica S.r.l.
Ple Coralloni, 12
61122 Pesaro ITALY

Ph +39 0721 26243
Fax +39 0721 26285
C.F. - P.I. IT 02523710412

www.amsanalitica.com
Mail info@amsanalitica.com
PEC amsanalitica@legalmail.it

RAPPORTO DI CALIBRAZIONE

Cliente: ST.RI.V.A S.R.L. Pesaro, 15/11/16

Si certifica che in data odierna, il nostro tecnico Sig. Manuel Girometti ha effettuato la calibrazione del seguente strumento:

- Tipo: Campionatore ambientale
- Costruttore: AMS Analitca s.r.l.
- Modello: AIRCUBE COM 2 ISO
- Matricola: 12-ACCISO-004
- Standard primario: Flussimetro BIOS DRYCAL DCL-H S/N 6418
- Certificazione std.: Certificato ISO17025 N° 32142 del 07/10/2015

Tabella riassuntiva delle misurazioni effettuate con comparazione tra la lettura sullo standard primario ed il valore riscontrato sul contatore volumetrico dello strumento sottoposto a calibrazione:

Portata nominale a bocca libera: 30200 ml/min

Flusso nominale strumento in prova (ml/min)	5000	10000	15000	19900	25000
Flusso rilevato sullo standard primario (ml/min)	5100	10100	14900	20000	24700

Condizioni ambientali della prova:

- Temperatura:20 °C

Standard Primario: Termometro TEMP5 S/N 171247 e sonda PT56L S/N 0986, Cert. LAT 16-ST-2957 del 18/10/2016

- Press.atmosferica: 1027(mBar)

Standard Primario: Calibratore Defender 520-L s/n 110731 con cert. ISO17025 n° 33368 del 25/1/16

A seguito delle prove effettuate lo strumento risulta perfettamente funzionante e conforme alla norma UNI EN 12919-2001

Il tecnico
Manuel Girometti

AMS ANALITICA SRL
Servizio Tecnico
Manuel Girometti

AQUARIA

CERTIFICATO DI CALIBRAZIONE

Campionatore d'aria mod. CF20

Data	**18-11-2016**
Certificato numero	**00176/16**
Matricola numero	**174**

CLIENTE

Nome	***ST.RI.V.A SRL***
Indirizzo	***VIA DON MILANI, 10***
CAP/Città	***87040 CASTROLIBERO (CS)***

ATTREZZATURE UTILIZZATE

a) Flussimetro a colonna range 0,6 – 5 l/min. matricola V-91203-06 certificato UKAS N° K45876F in data 13.02.2006

b) Flussimetro a colonna range 4 – 40 l/min. matricola V-94987-06 certificato UKAS N° K45897H in data 13.02.2006

PROCEDURA DI TARATURA

La procedura qui di seguito descritta ha lo scopo di verificare che le portate di aspirazione effettivamente realizzate dal campionatore siano corrispondenti a quelle teoriche di progetto.

Collegando il flussometro con range 0,6 – 5 l/min. per le prime 3 prove (bassi flussi) ed il secondo flussometro con range 4 – 40 l/min. per le prove degli alti flussi si verificano le misurazioni riportate in tabella.

AQUARIA

DATI SPERIMENTALI

TABELLADITARATURACF20

Portata impostata sul flussimetro certificato (l/min)	Tempo di campionamento (minuti)	Volume teorico campionato (litri)	Volume letto sul contatore volumetrico del CF20 (litri)	Errore %
1 l/min.	10 minuti	10	10	0%
2 l/min.	10 minuti	20	20	0%
3 l/min.	10 minuti	30	31,5	5%
5 l/min.	10 minuti	50	51	2%
10 l/min.	10 minuti	100	104	4%
20 l/min.	10 minuti	200	210	5%

Una volta effettuate le prove di cui sopra, si accerta (per ogni prova) che il volume d'aria misurata dal contatore volumetrico del CF20 non si discosti del ± 10% rispetto al volume teorico campionabile.

Se lo strumento rispetta i requisiti di cui sopra viene considerato conforme.

Periodicità consigliata di taratura: 12 mesi

Il responsabile della taratura

DUSTCHECK 5

DUSTCHECK 5 - **Gruppo sequenziale polveri PM10 e PM2,5**

Calsystem srl
Via De Chirico, 54/a – SAPORITO DI RENDE
Tel 0984.461203 Fax 0984.466337 E-mail: calsystem@sinergieanalitiche.it
www.sinergieanalitiche.it

DUSTCHECK 5

Il gruppo sequenziale per campionamento di polveri PM10 e PM2,5 DustCheck5 è un dispositivo leggero e compatto che consente il campionamento in sequenza di polveri per un numero massimo di 5 filtri. Il dispositivo è dotato di un gruppo di raccordo a 5 posizioni che consente di programmare fino a 5 giorni di prelievi di polveri. Tale opzione consente all'utilizzatore di risolvere a costi estremamente contenuti monitoraggi di polveri per periodi brevi senza dover utilizzare dispositivi ingombranti e costosi.

Il gruppo di campionamento sequenziale a 5 posti è la risposta a continue richieste per della strumentazione sempre più semplice da utilizzare e che non presenti particolari esigenze nel collocamento ed installazione. Il sistema consta di un supporto di derivazione completamente rivestito con teflon riducendo al minimo l'attrito con il passaggio delle polveri garantendo massima riproducibilità tra un campione e l'altro.

Il dispositivo sequenziale DustCheck5 è abbinabile alla linea di campionatori portatili AirCube HS ed HE consentendo le condizioni di campionamento previste dalla normativa EN-12341 recepita nel DM 60.

Alcune caratteristiche:

- Supporti di campionamento utilizzabili: 5 posizioni
- Direttamente collegabile alla linea di campionatori AirCube HE/HS
- Cabina per esterni con serratura di sicurezza
- Capacità di campionamento fino a 5 filtri
- Sensore della temperatura al filtro di campionamento
- Dimensioni: 30x30x32 cm
- Peso: Kg 6

La fornitura comprende:

- Modulo DustCheck5 completo di 5 portafiltri in PTFE con supporto per doppia membrana
- Cavo di collegamento al campionatore AirCube HE/HS
- Manuale di istruzione in Italiano
- Testa di prelievo per polveri PM10 secondo UNI-EN 12341

Come ordinare

Prodotto	Cod. catalogo
Gruppo sequenziale DustCheck Basic completo	600/DCB1001K

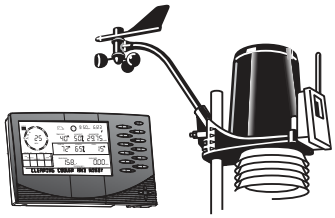
Calsystem srl
Via De Chirico, 54/a – SAPORITO DI RENDE
Tel 0984.461203 Fax 0984.466337 E-mail: calsystem@sinergieanalitiche.it
www.sinergieanalitiche.it

Impattore per polveri PM2,5 secondo i requisiti della normativa UNI-EN 14907 inseribile all'interno del preselettore in sostituzione dell'impattore per PM10	600/104.010.01
Supporto da campo per dispositivo sequenziale e campionatore AirCube HE/HS costruiti in alluminio anticorodal e verniciato con polveri epossidiche	600/AFSC001K
Membrane filtranti in fibra di vetro ricoperte in PTFE diametro 47mm conf.50 pezzi	PL/TBD7212

Calsystem srl
Via De Chirico, 54/a – SAPORITO DI RENDE
Tel 0984 461203 Fax 0984 466337 E-mail: calsystem@sinergieanalitiche.it
www.sinergieanalitiche.it

Wireless Vantage Pro2™ & Vantage Pro2™ Plus Stations

(Including Fan-Aspirated Models)



6152 6162
6153 6163

Vantage Pro2™ (6152, 6153) and Vantage Pro2™ Plus (6162, 6163) Wireless Weather Stations include two components: the Integrated Sensor Suite (ISS) which houses and manages the external sensor array, and the console which provides the user interface, data display, and calculations. The ISS and Vantage Pro2 console communicate via an FCC-certified, license-free, spread-spectrum frequency-hopping (FHSS) transmitter and receiver. User-selectable transmitter ID codes allow up to eight stations to coexist in the same geographic area. The frequency hopping spread spectrum technology provides greater communication strength over longer distances and areas of weaker reception. The Wireless Vantage Pro2 Plus weather station includes two additional sensors that are optional on the Vantage Pro2: the UV sensor and the solar radiation sensor.

The console may be powered by batteries or by the included AC-power adapter. The wireless ISS is solar powered with a battery backup. Use WeatherLink® for Vantage Pro2 and Vantage Vue® to let your weather station interface with a computer, to log weather data, and to upload weather information to the internet.

The 6152 and 6162 rely on passive shielding to reduce solar-radiation induced temperature errors in the outside temperature sensor readings. The Fan-aspirated 6153 and 6163 combine passive shielding with a solar-powered fan that draws outside air in over the temperature and humidity sensors, providing a much more accurate temperature reading than that available using passive shielding alone.

Integrated Sensor Suite (ISS)

(Includes product numbers: 6152, 6153, 6162, 6163, 6322, 6323, 6327 & 6328)

Operating Temperature	-40° to +150°F (-40° to +65°C)
Non-operating Temperature	-40° to +158°F (-40° to +70°C)
Current Draw (ISS SIM only)	0.14 mA (average), 30 mA (peak) at 4 to 6 VDC
Solar Power Panel	0.5 Watts (ISS SIM), plus 0.75 Watts (Fan-Aspirated)
Battery (ISS SIM /Fan-Aspirated)	CR-123 3-Volt Lithium cell / 2 - 1.2 Volt NiMH C-cells
Battery Life (3-Volt Lithium cell)	8 months without sunlight - greater than 2 years depending on solar charging
Battery Life (NiMH C-cells, Fan-Aspirated)	Up to 2 years
Fan Aspiration Rate (Fan-Aspirated only)	
Intake Flow Rate, full sun	190 feet/min. (0.9 m/s)
Intake Flow Rate, battery only	80 feet/min. (0.4 m/s)
Sensor Chamber Flow Rate, full sun	500 feet/min. (2.5 m/s)
Sensor Chamber Flow Rate, battery only	280 feet/min. (1.4 m/s)
Connectors, Sensor	Modular RJ-11
Cable Type	4-conductor, 26 AWG
Cable Length, Anemometer	40’ (12 m) (included) 240’ (73 m) (maximum recommended)

Note: Maximum displayable wind decreases as the length of cable increases. At 140’ (42 m) of cable, the maximum wind speed displayed is 135 mph (60 m/s); at 240’ (73 m), the maximum wind speed displayed is 100 mph (34 m/s).

Wind Speed Sensor	Solid state magnetic sensor
Wind Direction Sensor	Wind vane with potentiometer
Rain Collector Type	Tipping bucket, 0.01" per tip (0.2 mm with metric rain adapter), 33.2 in^2 (214 cm^2) collection area
Temperature Sensor Type	PN Junction Silicon Diode
Relative Humidity Sensor Type	Film capacitor element
Housing Material	UV-resistant ABS, ASA plastic (SPARS only)

ISS Dimensions (not including anemometer or bird spikes):

Davis Instruments 3465 Diablo Ave., Hayward, CA 94545-2778 USA
(510) 732-9229 • FAX (510) 670-0589 • sales@davisnet.com • www.davisnet.com

DS6152_62_53_63 (Rev. R 11/24/15)

Vantage Pro2 with Standard Rad Shield	14.0" x 9.4" x 14.5" (356 mm x 239 mm x 368 mm)
Vantage Pro2 with Fan-Aspirated Rad Shield	20.8" x 9.4" x 16.0" (528 mm x 239 mm x 406 mm)
Vantage Pro2 Plus with Standard Rad Shield	14.3" x 9.7" x 14.5" (363 mm x 246 mm x 368 mm)
Vantage Pro2 Plus with Fan-Aspirated Rad Shield	21.1" x 9.7" x 16.0" (536 mm x 246 mm x 406 mm)

Console

(Includes product number 6312)

Console Operating Temperature	+32° to +140°F (0° to +60°C)
Non-Operating (Storage) Temperature	+14° to +158°F (-10° to +70°C)
Current Draw	0.9 mA average, 30 mA peak, (add 120 mA for display lamps, add 0.125 mA for each optional wireless transmitter received by the console) at 4 - 6 VDC
AC Power Adapter	5 VDC, 300 mA, regulated
Batteries	3 C-cells
Battery Life	up to 9 months
Connectors	Modular RJ-11
Housing Material	UV-resistant ABS plastic
Console Display Type	LCD Transflective
Display Backlight	LEDs
Console Dimensions	
Console with antenna down (L x H x D)	10.625" x 6.125" x 1.625" (270 mm x 156 mm x 41 mm)
Console with antenna extended up (L x H x D)	10.625" x 9.625" x 1.625" (270 mm x 245 mm x 41 mm)
Display (L x H)	5.94" x 3.375" (151 mm x 86 mm)
Weight (with batteries)	1.88 lbs. (.85 kg)

Data Displayed on Console

Data display categories are listed with General first, then in alphabetical order.

General

Historical Data	Includes the past 24 values listed unless otherwise noted; all can be cleared and all totals reset
Daily Data	Includes the earliest time of occurrence of highs and lows; period begins/ends at 12:00 am
Monthly Data	Period begins/ends at 12:00 am on the first of the month
Yearly Data	Period begins/ends at 12:00 am on the first of January unless otherwise noted
Current Display Data	Current display data describes the current reading for each weather variable. In most cases, the variable lists the most recently updated reading or calculation. Some current variable displays can be adjusted so there is an offset for the reading
Current Graph Data	Current graph data appears in the right-most column in the console graph and represents the latest value within the last period on the graph; totals can be set or reset. Display intervals vary. Examples include: Instant, 15-min., and Hourly Reading; Daily, Monthly, High and Low
Graph Time Interval	1 min., 10 min., 15 min., 1 hour, 1 day, 1 month, 1 year (user-selectable, availability depends upon variable selected)
Graph Time Span	24 Intervals + Current Interval (see Graph Intervals to determine time span)
Graph Variable Span (Vertical Scale)	Automatic (varies depending upon data range); Maximum and Minimum value in range appear in ticker
Alarm Indication	Alarms sound for only 2 minutes (time alarm is always 1 minute) if operating on battery power. Alarm message is displayed in ticker as long as threshold is met or exceeded. Alarms can be silenced (but not cleared) by pressing the DONE key.
Transmission Interval	Varies with transmitter ID code from 2.25 seconds (#1=shortest), to 3 seconds (#8=longest)
Update Interval	Varies with sensor - see individual sensor specs

Barometric Pressure

Resolution and Units	0.01" Hg, 0.1 mm Hg, 0.1 hPa/mb (user-selectable)
Range	16.00" to 32.50" Hg, 410 to 820 mm Hg, 540 to 1100 hPa/mb
Elevation Range	-999' to +15,000' (-600 m to 4570 m) (Note that console screen limits entry of lower elevation to -999' when using feet as elevation unit.)
Uncorrected Reading Accuracy	±0.03" Hg (±0.8 mm Hg, ±1.0 hPa/mb) (at room temperature)
Sea-Level Reduction Equation Used	United States Method employed prior to use of current "R Factor" method
Equation Source	Smithsonian Meteorological Tables
Equation Accuracy	±0.01" Hg (±0.3 mm Hg, ±0.3 hPa/mb)
Elevation Accuracy Required	±10' (3m) to meet equation accuracy specification
Overall Accuracy	±0.03" Hg (±0.8 mm Hg, ±1.0 hPa/mb)
Trend (change in 3 hours)	Change 0.06" (2 hPa/mb,1.5 mm Hg) = Rapidly Change 0.02" (0.7hPa/mb, 0.5 mm Hg)= Slowly
Trend Indication	5 position arrow: Rising (rapidly or slowly), Steady, or Falling (rapidly or slowly)
Update Interval	1 minute or when console BAR key is pressed twice
Current Display	Instant
Current Graph Data	Instant, 15-min., and Hourly Reading; Daily, Monthly, High and Low
Historical Graph Data	15-min. and Hourly Reading; Daily, Monthly Highs and Lows
Alarms	High Threshold from Current Trend for Storm Clearing (Rising Trend Low Threshold from Current Trend for Storm Warning (Falling Trend)
Range for Rising and Falling Trend Alarms	0.01 to 0.25" Hg (0.1 to 6.4 mm Hg, 0.1 to 8.5 hPa/mb)

Clock

Resolution	1 minute
Units	Time: 12 or 24 hour format (user-selectable)
Date	US or International format (user-selectable)
Accuracy	±8 seconds/month
Adjustments	Time: Automatic Daylight Savings Time (for users in North America and Europe that observe it in AUTO mode, MANUAL setting available for all other areas) Date: Automatic Leap Year
Alarms	Once per day at set time when active

Dewpoint (calculated)

Resolution and Units	1°F or 1°C (user-selectable) °C is converted from °F rounded to the nearest 1°C
Range	-105° to +130°F (-76° to +54°C)
Accuracy	±2°F (±1°C) (typical)
Update Interval	10 to 12 seconds
Source	World Meteorological Organization (WMO)
Equation Used	WMO Equation with respect to saturation of moist air over water
Variables Used	Instant Outside Temperature and Instant Outside Relative Humidity
Current Display Data	Instant Calculation
Current Graph Data	Instant Calculation; Daily, Monthly High and Low
Historical Graph Data	Hourly Calculations; Daily, Monthly Highs and Lows
Alarms	High and Low Threshold from Instant Calculation

Evapotranspiration (calculated, requires solar radiation sensor)

Resolution and Units	0.01" or 0.1 mm (user-selectable)
Range	Daily to 32.67" (832.1 mm); Monthly & Yearly to 199.99" (1999.9 mm)
Accuracy	Greater of 0.01" (0.25 mm) or ±5%, Reference: side-by-side comparison against a CIMIS ET weather station
Update Interval	1 hour
Calculation and Source	Modified Penman Equation as implemented by CIMIS (California Irrigation Management Information System) including Net Radiation calculation
Current Display Data	Latest Hourly Total Calculation
Current Graph Data	Latest Hourly Total Calculation, Daily, Monthly, Yearly Total
Historical Graph Data	Hourly, Daily, Monthly, Yearly Totals
Alarm	High Threshold from Latest Daily Total Calculation

Forecast

Variables Used	Barometric Reading & Trend, Wind Speed & Direction, Rainfall, Temperature, Humidity, Latitude & Longitude, Time of Year
Update Interval	1 hour
Display Format	Icons on top center of display; detailed message in ticker at bottom
Variables Predicted	Sky Condition, Precipitation, Temperature Changes, Wind Direction and Speed

Heat Index (calculated)

Resolution and Units	1°F or 1°C (user-selectable) °C is converted from °F rounded to the nearest 1°C
Range	-40° to +165°F (-40° to +74°C)
Accuracy	±2°F (±1°C) (typical)
Update Interval	10 to 12 seconds
Source	United States National Weather Service (NWS)/NOAA
Formulation Used	Steadman (1979) modified by US NWS/NOAA and Davis Instruments to increase range of use
Variables Used	Instant Outside Temperature and Instant Outside Relative Humidity
Current Display Data	Instant Calculation
Current Graph Data	Instant Calculation; Daily, Monthly High
Historical Graph Data	Hourly Calculations; Daily, Monthly Highs
Alarm	High Threshold from Instant Calculation

Humidity

Inside Relative Humidity (sensor located in console)

Resolution and Units	1%
Range	1 to 100% RH
Accuracy	±3% from 1% to 90%; ±5% from 90% to 100%
Update Interval	1 minute
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant; Hourly Reading; Daily, Monthly High and Low
Historical Graph Data	Hourly Readings; Daily, Monthly Highs and Lows
Alarms	High and Low Threshold from Instant Reading

Outside Relative Humidity (sensor located in ISS)

Resolution and Units	1%
Range	1 to 100% RH
Accuracy	±2%
Temperature Coefficient	0.03% per °F (0.05% per °C), reference 68°F (20°C)
Drift	±0.5% per year
Update Interval	50 seconds to 1 minute
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant; Hourly Reading; Daily, Monthly High and Low
Historical Graph Data	Hourly Readings; Daily, Monthly Highs and Lows
Alarms	High and Low Threshold from Instant Reading

Extra Outside Relative Humidity (sensor located inside Temperature/Humidity Station)

Resolution and Units	1%
Range	1 to 100% RH
Accuracy	±2%
Temperature Coefficient	0.03% per °F (0.05% per °C), reference 68°F (20°C)
Drift	±0.5% per year
Update Interval	50 seconds to 1 minute
Current Display Data	Instant Reading (user adjustable)
Alarms	High and Low Threshold from Instant Reading

Leaf Wetness (requires leaf wetness sensor)

Resolution	1
Range	0 to 15
Dry/Wet Threshold	User-selectable
Accuracy	±0.5
Update Interval	46 to 54 seconds
Current Graph Data	Instant Reading; Daily High and Low; Monthly High
Historical Graph Data	Hourly Readings; Daily Highs and Lows; Monthly Highs
Alarms	High and Low Thresholds from Instant Reading

Moon Phase

Console Resolution	1/8 (12.5%) of a lunar cycle, 1/4 (25%) of lighted face on console
WeatherLink Resolution	0.09% of a lunar cycle, 0.18% of lighted face maximum (depends on screen resolution)
Range	New Moon, Waxing Crescent, First Quarter, Waxing Gibbous, Full Moon, Waning Gibbous, Last Quarter, Waning Crescent
Accuracy	±38 minutes

Rainfall

Resolution and Units	0.01" or 0.2 mm (user-selectable) (1 mm at totals ≥ 2000 mm)
Daily/Storm Rainfall Range	0 to 99.99" (0 to 999.8 mm)
Monthly/Yearly/Total Rainfall Range	0 to 199.99" (0 to 6553 mm)
Accuracy	For rain rates up to 4"/hr (100 mm/hr): ±4% of total or ± one tip of the bucket (0.01"/0.2mm), whichever is greater.
Update Interval	20 to 24 seconds
Storm Determination Method	0.02" (0.5 mm) begins a storm event, 24 hours without further accumulation ends a storm event
Current Display Data	Totals for Past 15-min
Current Graph Data	Totals for Past 15-min, Past 24-hour, Daily, Monthly, Yearly (start date user-selectable) and Storm (with begin date); Umbrella is displayed when 15-minute total exceeds zero
Historical Graph Data	Totals for 15-min, Daily, Monthly, Yearly (start date user-selectable) and Storm (with begin and end dates)
Alarms	High Threshold from Latest Flash Flood (15-min. total, default is 0.50", 12.7 mm), 24-Hour Total, Storm Total,
Range for Rain Alarms	0 to 99.99" (0 to 999.7 mm)

Rain Rate

Resolution and Units	0.01" or 0.1 mm (user-selectable) at typical rates (see Fig. 4 and 5)
Range	0, 0.04"/hr (1 mm/hr) to 96"/hr (0 to 2438 mm/hr)
Accuracy	±5% for rates less than 5" per hour (127 mm/hr)
Update Interval	20 to 24 seconds
Calculation Method	Measures time between successive tips of tipping bucket. Elapsed time greater than 15 minutes or only one tip of the rain collector constitutes a rain rate of zero.
Current Display Data	Instant
Current Graph Data	Instant and 1-min. Reading; Hourly, Daily, Monthly and Yearly High
Historical Graph Data	1-min Reading; Hourly, Daily, Monthly and Yearly Highs
Alarm	High Threshold from Instant Reading

Soil Moisture (requires soil moisture sensor)

Resolution	1 cb
Range	0 to 200 cb
Update Interval	77 to 90 seconds
Current Graph Data	Instant Reading; Daily and Monthly High and Low
Historical Graph Data	Hourly Readings; Daily and Monthly Highs and Lows
Alarms	High and Low Thresholds from Instant Reading

Solar Radiation (requires solar radiation sensor)

Resolution and Units	1 W/m^2
Range	0 to 1800 W/m^2
Accuracy	±5% of full scale (Reference: Eppley PSP at 1000 W/m^2)
Drift	up to ±2% per year
Cosine Response	±3% for angle of incidence from 0° to 75°
Temperature Coefficient	-0.067% per °F (-0.12% per °C); reference temperature = 77°F (25 °C)
Update Interval	50 seconds to 1 minute (5 minutes when dark)
Current Graph Data	Instant Reading and Hourly Average; Daily, Monthly High
Historical Graph Data	Hourly Average, Daily, Monthly Highs
Alarm	High Threshold from Instant Reading

Sunrise and Sunset

Resolution	1 minute
Accuracy	±1 minute
Reference	United States Naval Observatory

Temperature

Inside Temperature (sensor located in console)	
Resolution and Units	Current Data: 0.1°F or 1°F or 0.1°C or 1°C (user-selectable) °C is converted from °F rounded to the nearest 1°C Historical Data and Alarms: 1°F or 1°C (user-selectable)
Range	+32° to +140°F (0° to +60°C)
Sensor Accuracy	±1°F (±0.5°C) (typical) See Fig. 2
Update Interval	1 minute
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant Reading; Daily and Monthly High and Low
Historical Graph Data	Hourly Readings; Daily and Monthly Highs and Lows
Alarms	High and Low Thresholds from Instant Reading
Outside Temperature (sensor located in ISS)	
Resolution and Units	Current Data: 0.1°F or 1°F or 0.1°C or 1°C (user-selectable) nominal °C is converted from °F rounded to the nearest 1°C Historical Data and Alarms: 1°F or 1°C (user-selectable)
Range	-40° to +150°F (-40° to +65°C)
Sensor Accuracy	±0.5°F (±0.3°C) See Fig. 1
Radiation Induced Error (Passive Shield)	+4°F (2°C) at solar noon (insolation = 1040 W/m^2, avg. wind speed ≤ 2 mph (1 ms)) (reference: RM Young Model 43408 Fan-Aspirated Radiation Shield)
Radiation Induced Error (Fan-Aspirated Shield)	+0.6°F (0.3°C) at solar noon (insolation = 1040 W/m^2, avg. wind speed ≤ 2 mph (1 m/s)) (reference: RM Young Model 43408 Fan-Aspirated Radiation Shield)
Update Interval	10 to 12 seconds
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant Reading; Daily, Monthly, Yearly High and Low
Historical Graph Data	Hourly Readings; Daily, Monthly, Yearly Highs and Lows
Alarms	High and Low Thresholds from Instant Reading
Extra Temperature Probes	
Resolution and Units	Current Data: 1°F or 1°C (user-selectable) °C is converted from °F rounded to the nearest 1°C Historical Data and Alarms: 1°F or 1°C (user-selectable)
Range	-40° to +150°F (-40° to +65°C)
Sensor Accuracy	±1°F (±0.5°C) (typical) See Fig. 3
Update Interval	10 to 12 seconds (77 to 90 seconds for Leaf Wetness/Temperature and Soil Moisture/Temperature Stations)
Current Display Data	Instant Reading (user-adjustable offset available)
Alarms	High and Low Thresholds from Instant Reading

Temperature Humidity Sun Wind Index (requires solar radiation sensor)

Resolution and Units	1°F or 1°C (user-selectable) °C is converted from °F rounded to the nearest 1°C
Range	-90° to +165°F (-68° to +74°C)
Accuracy	±4°F (±2°C) (typical)
Update Interval	10 to 12 seconds
Sources and Formulation Used	United States National Weather Service (NWS)/NOAA Steadman (1979) modified by US NWS/NOAA and Davis Instruments to increase range of use and allow for cold weather use
Variables Used	Instant Outside Temperature, Instant Outside Relative Humidity, 10-minute Average Wind Speed, 10-minute Average Solar Radiation
Formulation Description	Uses Heat Index as base temperature, affects of wind and solar radiation are either added or subtracted from this base to give an overall effective temperature
Current Graph Data	Instant and Hourly Calculation; Daily, Monthly High
Historical Graph Data	Hourly Calculation; Daily, Monthly Highs
Alarm	High Threshold from Instant Reading

Ultra Violet (UV) Radiation Dose (requires UV sensor)

Resolution and Units	0.1 MEDs to 19.9 MEDs; 1 MED above 19.9 MEDS
Range	0 to 199 MEDs
Accuracy	±5% of daily total
Drift	up to ±2% per year
Update Interval	50 seconds to 1 minute (5 minutes when dark)
Current Graph Data	Latest Daily Total (user resettable at any time from Current Screen)
Historical Graph Data	Hourly, Daily Totals (user reset from Current Screen does not affect these values)
Alarm	High Threshold from Daily Total
Alarm Range	0 to 19.9 MEDs

Ultra Violet (UV) Radiation Index (requires UV sensor)

Resolution and Units	0.1 Index
Range	0 to 16 Index
Accuracy	±5% of full scale (Reference: Yankee UVB-1 at UV index 10 (Extremely High))
Cosine Response	±4% FS (0° to 90° zenith angle)
Update Interval	50 seconds to 1 minute (5 minutes when dark)
Current Graph Data	Instant Reading and Hourly Average; Daily, Monthly High
Historical Graph Data	Hourly Average, Daily, Monthly Highs
Alarm	High Threshold from Instant Calculation

Wind

Wind Chill (Calculated)

Resolution and Units	1°F or 1°C (user-selectable) °C is converted from °F rounded to the nearest 1°C
Range	-110° to +135°F (-79° to +57°C)
Accuracy	±2°F (±1°C) (typical)
Update Interval	10 to 12 seconds
Source	United States National Weather Service (NWS)/NOAA
Equation Used	Osczevski (1995) (adopted by US NWS in 2001)
Variables Used	Instant Outside Temperature and 10-min. Avg. Wind Speed
Current Display Data	Instant Calculation
Current Graph Data	Instant Calculation; Hourly, Daily and Monthly Low
Historical Graph Data	Hourly, Daily and Monthly Lows
Alarm	Low Threshold from Instant Calculation

Wind Direction

Range	0 - 360°
Display Resolution	16 points (22.5°) on compass rose, 1° in numeric display
Accuracy	±3°
Update Interval	2.5 to 3 seconds
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant; 10-min. Dominant; Hourly, Daily, Monthly Dominant
Historical Graph Data	Past 6 10-min. Dominants on compass rose only; Hourly, Daily, Monthly Dominants

Wind Speed

Resolution and Units	1 mph, 1 km/h, 0.4 m/s, or 1 knot (user-selectable). Measured in mph, other units are converted from mph and rounded to nearest 1 km/hr, 0.1 m/s, or 1 knot.
Range	1 to 200 mph, 1 to 173 knots, 0.5 to 89 m/s, 1 to 322 km/h
Update Interval	Instant Reading: 2.5 to 3 seconds, 10-minute Average: 1 minute
Accuracy	±2 mph (2 kts, 3 km/h, 1 m/s) or ±5%, whichever is greater
Maximum Cable Length	240’ (73 m) (See note on page 1)
Current Display Data	Instant
Current Graph Data	Instant; 10-minute and Hourly Average; Hourly High; Daily, Monthly and Yearly High with Direction of High
Historical Graph Data	10-min. and Hourly Averages; Hourly Highs; Daily, Monthly and Yearly Highs with Direction of Highs
Alarms	High Thresholds from Instant Reading and 10-minute Average

Wireless Communications

Transmit/Receive Frequency

US Models	902 - 928 MHz FHSS,
EU Models	868.0 - 868.6 MHz FHSS
Japan Models	928.15 - 929.65 MHz FHSS
NZ Models	921 - 928 MHz FHSS
India Models	865.0 - 867.0 MHz FHSS

ID Codes Available	8

Output Power

US Models	902 - 928 MHz FHSS: FCC-certified low power, less than 8 mW, no license required
EU Models	868.0 - 868.6 MHz FHSS. CE-certified, less than 8 mW, no license required.
Japan Models	928.15 - 929.65 MHz FHSS, less than 1 mW, no license required.
NZ Models	921- 928 MHz FHSS, less than 10mW, no license required.
India Models	865.0 - 867.0 MHz, less than 10mW, no license required.

Range: All models except Japan

Line of Sight	up to 1000 feet (300 m)
Through Walls	200 to 400 feet (60 to 120 m)

Range: Japan models

Line of Sight	up to 300 feet (100 m)
Through Walls	50 to 200 feet (15 to 60m)

Sensor Inputs

RF Filtering	RC low-pass filter on each signal line

Sensor Charts

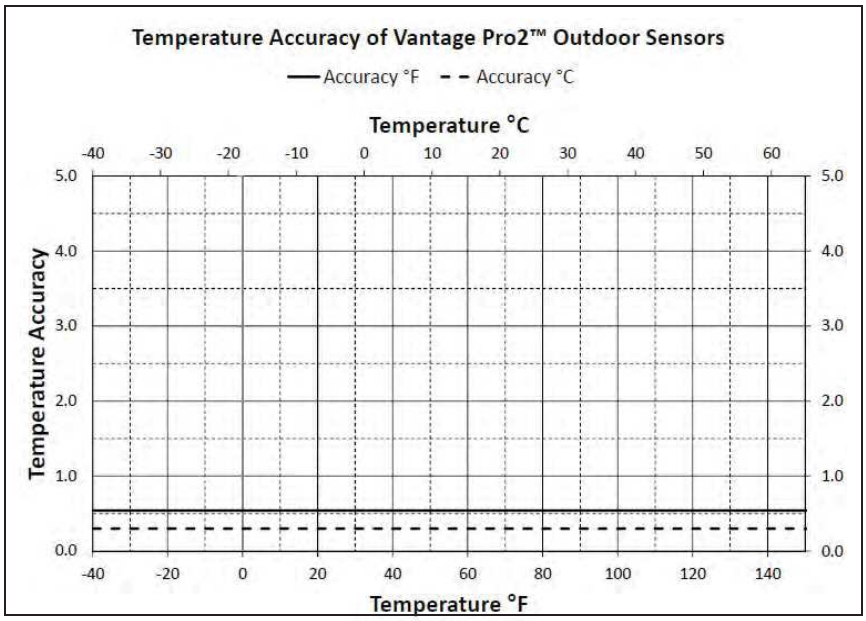


Figure 1. Temperature Accuracy of Vantage Pro2 ISS Sensors

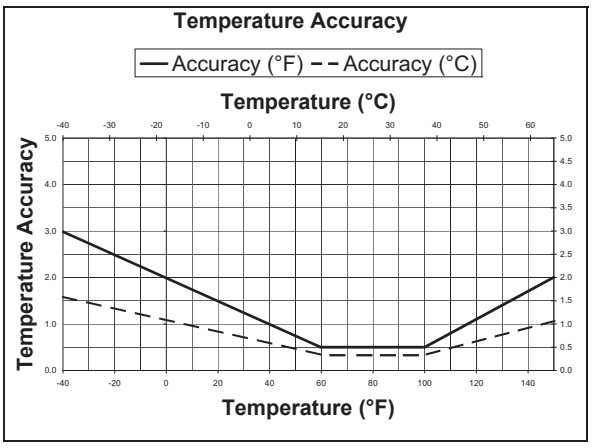


Figure 2.Inside Temperature Accuracy

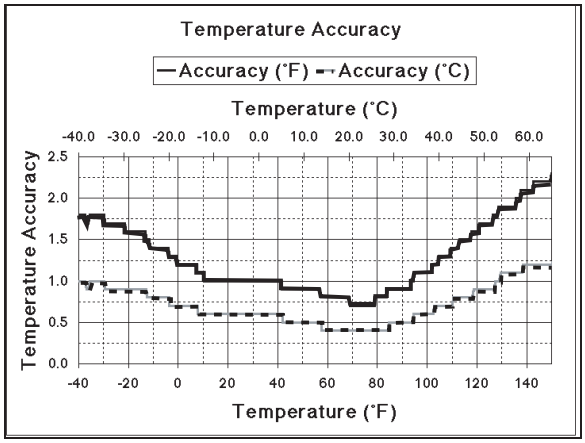


Figure 3. External Temperature Probe Accuracy

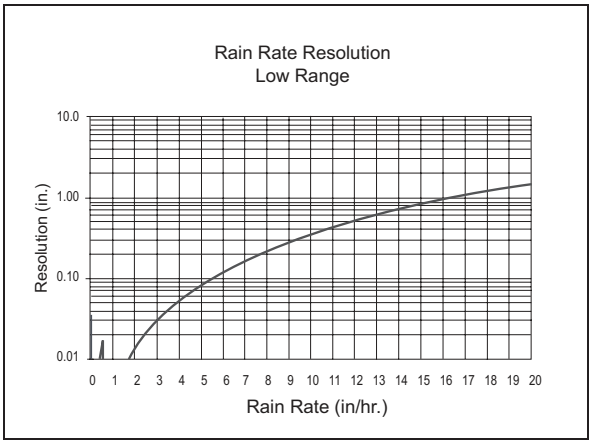


Figure 4. Low Range Rain Rate Resolution

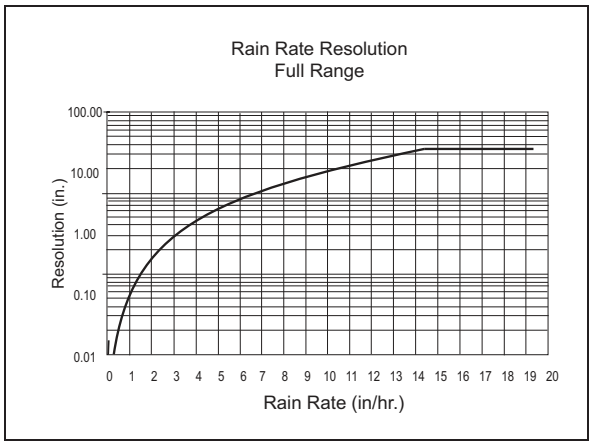


Figure 5: Full Range Rain Rate Resolution

Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6152 6152EU 6152UK	17.50" x 10.4" x 16.0" (445 mm x 264 mm x 406 mm)	11 lbs. 13 oz. (5.4 kg)	011698 00229 0 011698 00347 1 011698 00348 8
6162 6162EU 6162UK		11 lbs. 15 oz. (5.4 kg)	011698 00306 8 011698 00307 5 001698 00308 2
6153 6153EU 6153UK	14.9 x 12.9" x 23.4" (378 mm x 327 mm x 594 mm)	16 lbs. 11 oz. (7.6 kg)	011698 00335 8 011698 00336 5 001698 00337 2
6163 6163EU 6163UK		17 lbs. 5 oz. (7.9 kg)	011698 00341 9 011698 00342 6 001698 00342 3
6322 6322OV	17.50" x 10.4" x 16.0" (445 mm x 264 mm x 406 mm)	9 lbs.. 1 oz. (4.1 kg)	011698 00776 9 011698 00778 3
6327 6327OV		11 lbs. 1 oz. (5.0 kg)	011698 00781 3 011698 00783 7
6323 6323OV	14.9" x 12.9" x 23.4" (378 mm x 327 mm x 594 mm	15 lbs. 15 oz. (7.2 kg)	011698 00779 0 011698 00780 6
6328 6328OV		16 lbs. 8 oz. (7.5 kg)	011698 00784 4 011698 00785 1
6312 6312EU 6312UK	12.6" x 9.3" x 2.5" (320 mm x 235 mm x 64 mm)	2 lbs. 10 oz. (1.2 kg)	011698 00724 0 011698 00766 0 011698 00767 7