

Annex E

Calibration Certification for  
the On-line Stack  
Monitoring System

Annex E1

## Calibration Certification for the CEMS

(1)

# Commissioning Check List 试运行检查项目表 MCS100FT

<b>Customer data 客户资料</b>	
Customer: <u>OSCAR</u>	Plant: <u>OWTF</u>
Location: <u>SHW</u>	

<b>1. Device data 设备资料</b>
Device type 设备类型: <u>MCS100FT (1)</u>
Serial no. 序列号: <u>1607 0493</u>
Sample probe type 取样探头类型: <u>SFU</u>

<b>2. Plant data 电厂资料</b>			
Location 标签编号	Outside 室外 <input type="checkbox"/>	Under cover 有保护罩 <input type="checkbox"/>	Inside 室内 <input checked="" type="checkbox"/>
Orientation of the stack 取样点方向	Horizontal 水平 <input type="checkbox"/>	Vertical 垂直 <input checked="" type="checkbox"/>	
	Horizontal 水平 <input checked="" type="checkbox"/>	Vertical 垂直 <input type="checkbox"/>	
Orientation of sample gas probe 取样探头方向	Horizontal 水平 <input checked="" type="checkbox"/>	Vertical 垂直 <input type="checkbox"/>	
Pressure 压力 <u>1010</u> hpa	Gas temperature 烟气温度 <u>410</u> °C		
Plant operating status 电厂运行情况 <u>Normal</u>			

<b>3. Prerequisite 系统运行条件</b>			
	Y	N	Remarks 备注
3.1. Documentation + Delivery complete 文件+货物是否齐全	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.2. Platform at measurement spot has suitable dimension? 测量点平台的尺寸是否合适?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.3. If this measurement location is under legal regulation, has it been acknowledged by an official body? 如果安装位置需要符合法律法规, 此安装位置是否被官方认可?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.4. Customer specific data for parameterization available? 用户对系统参数的特殊要求是否可行?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.5. Cables, tubes and sample line installed but not connected? 电缆、管线和取样管线安装但没有连接?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.6. Compressed air station installed and compressed air available? 压缩空气站已安装并且压缩空气可以使用?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

4. Preliminary work 预备工作		Y	N	Remarks 备注
4.1. Mounting of flanges like described in the Operating Instruction? 法兰安装是否按照图纸?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
4.2. Check for damage 检查外部损伤	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
4.3. Check ambient conditions 检查环境条件	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
4.4. Check mounting conditions 检查安装条件	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
4.5. Check cables / wires for correct installation 检查电缆/电线及其连接状况	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
4.6. Check main power supply voltage 检查总供电电压	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

5. Periphery 外部设备		Y	N	Remarks 备注
5.1. Check compressed air supply 检查压缩空气供应	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Inlet 入口(5 bar): 6 Bar				

6. Sample probe 取样探头		Y	N	Remarks 备注
6.1. Connect bundle of tubes and cables 管线和电缆的连接	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
6.2. Install probe 探头安装	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

7. MCS100FT		Y	N	Remarks 备注
7.1. Switch on analyzer and wait for warm up 打开分析仪并等待预热	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
7.2. Check sample conditions 检查样气情况	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Flow rate 流量: 230 l/h				
7.3. Check zero conditions 检查零点情况	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Flow rate 流量: 160 l/h				
7.4. Perform zero point setting 零点设置	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Test results within specification.
7.5. Perform span test 量程测试	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
7.6. Parameterize the I/O Module 设置 I/O 模块参数	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
7.7. Measured values are plausible 测量值是否合理	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
7.8. Save device data 储存设备数据	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
7.9. Complete Commissioning Sign-Off Sheet 完成试运行签署表	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
7.10. Instruct the operator personnel 操作员培训 Hand over the maintenance manual and check lists 移交维护手册和检查表 - Measurement reading 读取测量值 - Perform customer maintenance 演示维护方法 - Read messages 读取信息	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

### 8. Measured value

Index 编号	Source 信号源	Unit 单位	Range 范围		Reading (actual) 实际读数	Output value 产值
			Start 开始	End 结束		
1	HCL	mg/Nm <sup>3</sup>	0	120	60.22 ppm	60.22 ppm
2	HF	mg/Nm <sup>3</sup>	0	5	4.34 ppm	4.34 ppm
3	CO	mg/Nm <sup>3</sup>	0	1000	128.21 ppm	128.20 ppm
4	NO	mg/Nm <sup>3</sup>	0	500	122.01 ppm	122.00 ppm
5	NO <sub>2</sub>	mg/Nm <sup>3</sup>	0	200	98.81 ppm	98.80 ppm
6	NO <sub>x</sub>	mg/Nm <sup>3</sup>	0	500	412.11 mg/m <sup>3</sup>	412.12 mg/m <sup>3</sup>
7	SO <sub>2</sub>	mg/Nm <sup>3</sup>	0	300	83.21 ppm	83.21 ppm
8	CO <sub>2</sub>	Vol o/o	0	25	20.01 o/o	20.01 o/o
9	H <sub>2</sub> O	Vol o/o	0	40	32.02 o/o	32.01 o/o
10	O <sub>2</sub>	Vol o/o	0	21	20.95 o/o	20.95 o/o
11	TOC	mg/Nm <sup>3</sup>	0	300	122.01 ppm	122.01 ppm
12	NH <sub>3</sub>	mg/Nm <sup>3</sup>	0	100	53.30 ppm	53.31 ppm
13	CH <sub>4</sub>	mg/Nm <sup>3</sup>	0	100	112.01 ppm	112.01 ppm
14						
15						

Remarks 备注	
<p>Date 日期: <u>25/7/2018</u></p> <p>Engineer 工程师: <u></u> </p>	<p>Name 签名</p> <p>Plant personnel 用户代表: <u></u></p>

(2)

# Commissioning Check List 试运行检查项目表

## MCS100FT

<b>Customer data 客户资料</b>	
Customer: <u>Oscar</u>	Plant: <u>OWTF</u>
Location: <u>SHW</u>	

<b>1. Device data 设备资料</b>
Device type 设备类型: <u>MCS100FT (2)</u>
Serial no. 序列号: <u>1607 0494</u>
Sample probe type 取样探头类型: <u>SFU</u>

<b>2. Plant data 电厂资料</b>			
Location 标签编号	Outside 室外 <input type="checkbox"/>	Under cover 有保护罩 <input type="checkbox"/>	Inside 室内 <input checked="" type="checkbox"/>
Orientation of the stack 取样点 方向	Horizontal 水平 <input type="checkbox"/>	Vertical 垂直 <input checked="" type="checkbox"/>	
Orientation of sample gas probe 取样探头方向	Horizontal 水平 <input checked="" type="checkbox"/>	Vertical 垂直 <input type="checkbox"/>	
Pressure 压力 <u>1010</u> hpa		Gas temperature 烟气温度 <u>410</u> °C	
Plant operating status 电厂运行情况 <u>Normal</u>			

<b>3. Prerequisite 系统运行条件</b>			
	Y	N	Remarks 备注
3.1. Documentation + Delivery complete 文件+货物是否齐全	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.2. Platform at measurement spot has suitable dimension? 测量点平台的尺寸是否合适?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.3. If this measurement location is under legal regulation, has it been acknowledged by an official body? 如果安装位置需要符合法律法规, 此安装 位置是否被官方认可?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.4. Customer specific data for parameterization available? 用户对系统参数的特殊要求是否可行?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.5. Cables, tubes and sample line installed but not connected? 电缆、管线和取样管线安装但没有连接?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3.6. Compressed air station installed and compressed air available? 压缩空气站已安装并且压缩空气可以使 用?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

4. Preliminary work 预备工作			
	Y	N	Remarks 备注
4.1. Mounting of flanges like described in the Operating Instruction? 法兰安装是否按照图纸?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4.2. Check for damage 检查外部损伤	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4.3. Check ambient conditions 检查环境条件	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4.4. Check mounting conditions 检查安装条件	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4.5. Check cables / wires for correct installation 检查电缆/电线及其连接状况	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4.6. Check main power supply voltage 检查总供电电压	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

5. Periphery 外部设备			
	Y	N	Remarks 备注
5.1. Check compressed air supply 检查压缩空气供应	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Inlet 入口(5 bar):      6      Bar			



6. Sample probe 取样探头			
	Y	N	Remarks 备注
6.1. Connect bundle of tubes and cables 管线和电缆的连接	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6.2. Install probe 探头安装	<input checked="" type="checkbox"/>	<input type="checkbox"/>	



7. MCS100FT		Y	N	Remarks 备注
7.1. Switch on analyzer and wait for warm up 打开分析仪并等待预热	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
7.2. Check sample conditions 检查样气情况	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Flow rate 流量: 240 l/h				
7.3. Check zero conditions 检查零点情况	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Flow rate 流量: 150 l/h				
7.4. Perform zero point setting 零点设置	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
7.5. Perform span test 量程测试	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<i>Test results within specification.</i>
7.6. Parameterize the I/O Module 设置 I/O 模块参数	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
7.7. Measured values are plausible 测量值是否合理	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
7.8. Save device data 储存设备数据	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
7.9. Complete Commissioning Sign-Off Sheet 完成试运行签署表	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
7.10. Instruct the operator personnel 操作员培训 Hand over the maintenance manual and check lists 移交维护手册和检查表 - Measurement reading 读取测量值 - Perform customer maintenance 演示维护方法 - Read messages 读取信息	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

### 8. Measured value

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3	CO	mg/Nm <sup>3</sup>	0	1000	128.20 ppm	128.20 ppm
4	NO	mg/Nm <sup>3</sup>	0	500	122.00 ppm	122.00 ppm
5	NO <sub>2</sub>	mg/Nm <sup>3</sup>	0	200	98.80 ppm	98.81 ppm
6	NO <sub>x</sub>	mg/Nm <sup>3</sup>	0	500	412.22 mg/m <sup>3</sup>	412.21 mg/m <sup>3</sup>
7	SO <sub>2</sub>	mg/Nm <sup>3</sup>	0	300	83.21 ppm	83.21 ppm
8	CO <sub>2</sub>	Vol o/o	0	25	20.00 o/o	20.00 o/o
9	H <sub>2</sub> O	Vol o/o	0	40	32.01 o/o	32.01 o/o
10	O <sub>2</sub>	Vol o/o	0	21	20.95 o/o	20.95 o/o
11	TOC	mg/Nm <sup>3</sup>	0	300	122.01 ppm	122.01 ppm
12	NH <sub>3</sub>	mg/Nm <sup>3</sup>	0	100	53.30 ppm	53.30 ppm
13	CH <sub>4</sub>	mg/Nm <sup>3</sup>	0	100	112.02 ppm	112.02 ppm
14						
15						

Remarks 备注	
<p>Date 日期: <u>25/7/2018</u></p> <p>Engineer 工程师: <u></u> </p>	<p>Name 签名</p> <p>Plant personnel 用户代表: <u></u></p>

Annex E2


## Calibration Certification for the CAPCS

# QM Zertifikat / QM certificate

## Dusthunter SP30



### Identifikation / identification

Artikel Nr. / Part No.: **1089203** **DHSP30-T2V2FPNNNNXXS**   
Ident Nr. / Ident no.: 00116 Serien Nr. / Serial no.: **18168223**  
Firmware Version / Firmware version: 01.02.06 (Feb 27 2018 11:37:54)  
Bootloader Version / Bootloader version: 01.00.02  
Hardware Revision / Hardware version: 1.2  
Geräteausführung / Device version:  
BUS-Adresse / Bus address: 1

### Parameter / Parameter

Sensorantwortzeit 60.0 sec. Gebläse / Blower: installiert  
*Sensor response time installed*

### Messgrößen u. Koeffizienten / Measuring variables and coefficients

Streulichtfaktoren / Scattered light coefficients: Referenzgerät Streulicht DHSP100 Serien-Nr.:  
*Reference measuring device DHSP100 Serial no.:*  
CC0 (abs.): -0.3800 **SN: 00014 / 08518553**  
CC1 (lin.): 0.6850  
CC2 (square): 0.0000  
Verstärkungsfaktor, Offset / Gain factor, Offset: Spantest 70 Laser / 70.00 %  
Gain 0: 10.0000 Offset 0: 0.00045 *Span 70 Laser*  
Faktoren Analogausgang / Analog Output factors: Relais 3: Wartung / Maintenance  
CC0 (abs.): 2.00  
CC1 (lin.): 170.85  
CC2 (square): 0.00

### Koeffizientensätze Messbereich 0 / Coefficient Sets meas. range 0:

Koeff. Satz 1 / Coeff. set 1:		Koeff. Satz 2 / Coeff. set 2:	
CC 0 (abs.):	0.0000	CC 0 (abs.):	0.0000
CC 1 (lin.):	1.0000	CC 1 (lin.):	1.0000
CC 2 (square):	0.0000	CC 2 (square):	0.0000

### Messbereich, Grenzwert / Meas. range, limit:

Messbereichsschalter / 0 (Software)  
*Meas. range switch:*  
Messbereich Wert1 / 0.0 mg  
*Meas. range low value:*  
Messbereich Wert2 / 75.0 mg  
*Meas. range high value:*  
Grenzwert / Limit value: 50.0 mg  
Gebläse Druck/Blower Pressure: 10.0 mbar

### Modbus Schnittstelle / Modbus interface:

Protokoll / protocol: RTU  
Adresse / address: 1  
Baudrate / baudrate: 19200  
Datenbits Parität Stopbits 8 EVEN 1  
*/ Databits parity stopbits:*  
Endian Codierung / endian code: NONE

Das Gerät mit der o.g. Serien-Nr. wurde überprüft und kalibriert nach den Qualitätsstandards der SICK-Gruppe basierend auf einem nach ISO9001 zertifizierten Qualitätssicherungssystem.

*This device with the serial no. noted above has been tested and calibrated according to the quality standards of the SICK-Group, which are based on a ISO9001 certified Quality Assurance System.*

Ottendorf-Okrilla, 16.04.2018

Unterschrift:  
Signature:

