

ACF-NT

Multi-Component Analysis System for Emission and Process Monitoring



Continuous, quantitative and selective measurement of HCl, HF, H₂O, CO, CO₂, SO₂, NO, NO₂, CH₄, NH₃, N₂O, H₂CO, CH₃OH, O₂ and VOC (other gases on request)

Maximum 12 measuring components (standard), simple upgrade on request

Proven hot wet extractive measurement technique

High stability, accuracy and reliability through proven FTIR technology

Fully integrated VOC and O₂ analyzers (optional)

Unique air-driven injector pump, no moving parts, low condensate to handle

Low ownership, maintenance and installation cost through multi-component measurement technology with only one sampling system

Complete pre-engineered system, modest space requirement, compact and modular system design

Clear-text status messages and user-friendly operator interface on a large back-lit display

Measured value and status signal transmission to DCS and emission evaluators via analog and digital outputs as well as via Modbus, Profibus or Ethernet

Local control for service purposes via Ethernet and remote maintenance via modem

Integration and display of signals from other detectors (e. g. dust, mercury, flow, pressure, temperature)

Description

ACF-NT Analysis System

As a result of the growing requirements in the field of environmental monitoring, increasing number of pollutants and with lower concentrations have to be measured from combustion processes.

World leader in stack gas monitoring systems for decades and pioneer in FTIR technology, ABB Analytical is offering an inexpensive and forward-looking system with the ACF-NT multi-component analysis system for emission and process monitoring.

Recognized by the process industries for their ruggedness, the ABB FTIR spectrometers offer a measurement technology with the highest levels of accuracy, selectivity and reliability. As a result of the FTIR measurement principle, the spectrometer is free from drift and does not require frequent calibrations, therefore there is no need to hold stocks of expensive, dangerous and toxic test gases.

Because it can easily be expanded through software to measure additional infrared-active components, the analysis system is also designed to expand with your future needs.

The sampling probe, sampling line and analyzer cell are heated allowing water vapor to be measured along with extremely low detection levels of pollutant such as HCl, NH₃ and HF.

The sample gas delivery is using an electronically controlled air injector, which creates a vacuum. This draws the sample gas into the analyzer cell without the use of a mechanical pump. Thus, no moving part is used resulting in less maintenance. As a beneficial side effect, the sample gas is diluted at the analyzer cell outlet, condensation is reduced and disposal of the exhaust gas is safer.

Applications

- Municipal waste incinerators
- Biomedical and sludge incinerators
- Hazardous waste incinerators at chemical plants
- Gasification and pyrolysis processes
- Cement kilns
- Solvent recovery and destruction
- DeNO_x and DeSO_x of power plants
- Crematoria
- Steel and aluminum smelters
- Brick, tiles and glass manufacturing
- Catalyst protection monitoring
- Combustion research

Devices and Subassemblies of the System

Sampling System

- Probe tube, optionally heated, lengths 500 to 2500 mm for process temperature up to 500 °C (optional up to 1350 °C)
- Filtering device, heated to 180 °C
- Sample gas lines, heated to 180 °C, length up to 60 m (other lengths and temperature on request)
- Protective cover for probe (optional)
- Probe back purge module (optional)
- Automatic injection of test gases at probe for drift check (optional)

Sample Gas Conditioning Unit

- Heated sample gas conditioning block with built-in SS-microporous filter
- Air driven injector pump module
- Connection ports for oxygen and VOC analyzers and for third-party analyzers
- Connection and automatic switchover for zero and calibration gas supply
- Flow, pressure and temperature monitoring

Analyzers

- FTIR spectrometer with heated sample cell
- Oxygen analyzer (ZrO₂ detector, optional)
- VOC analyzer (FID detector, optional)

Control and Display Units

- Display and operator control unit built into cabinet door
- AO2000 system controller
- FTIR system controller
- Control modules for the injector pump, oxygen and VOC analyzers
- Interfaces for
 - Measured values and status signals (analog and digital outputs; Modbus, Profibus and Ethernet optional)
 - Remote control and diagnostics (Modem and/or Ethernet)
- Prepared for UPS for uninterrupted power supply of the most important subassemblies (optional)

Air Purification

A compressed-air purification unit (molecular sieve) is used to provide zero gas for the FTIR spectrometer and the oxygen analyzer. Purge air is also used by the spectrometer and also to purge the analysis system in the event of heating failure or loss of power.

Operation

The software installed in the controller operates the analysis system completely automatically. It allows the following functions:

- Display of all measured results and clear status messages
- Manual operation of the system for commissioning and service
- Local operation for service purposes via Ethernet interface

Description

- Remote diagnosis via modem
- Self-diagnosis of the FTIR spectrometer and archival of the status signal and measured data
- Optional automatic correction for dry/wet basis and reference measurement (to a fixed O₂ value)
- The FTIR results are averaged over 120 seconds (default setting) to allow for minimal measuring ranges. Through the sliding average the analytical results refreshment time is < 40 seconds. Shorter averaging and refreshment time available (depending on the ranges).

The system controller continuously monitors the temperature, pressure and gas flow to ensure automatic correction, reliability and precise measurement. If the temperature of any heated module of the analysis system falls below the minimum allowed, a stream of clean air purge is triggered to protect all subassemblies that are in contact with the sample gas.

The Ethernet interface allows the analysis system to be coupled to the plant network for transfer of measured values and status signals. Data can be read using the AnalyzeIT Explorer or AO2000 OPC Server software tools.

The telephone modem gives access to the ABB Service Department (when enabled by the customer) for remote diagnosis and preventive maintenance scheduling which enables maximum system availability.

Calibration

All FTIR device-dependent factors are taken into account through the daily automatic recording of the zero spectrum. Since absorption spectra are absolute and do not drift, zero and span are effectively automatically corrected using zero gas only.

Cost of ownership reduction is achieved by using the same test gas cylinder for zero calibration of the oxygen analyzer and the VOC analyzer.

Manual calibration check with gases and water vapor can easily be done at the analyzer cell or at the sampling probe according to internationally recognized requirements.

Certification

The analysis system is approved by the German TÜV Rheinland. It has been successfully tested and achieved the certification according the German and European requirements for emissions protection laws. Report No. 936/21210471/A dated 13th February 2009

The analysis system complies with the CEM performance standards from the UK Environment Agency, and also with the US EPA and ASTM standards issued for FTIR continuous emission monitoring systems (US EPA 40CFR Part 60-PS 15 and ASTM D6348-98).

The analysis system is CSA certified for use in general purpose environment, evidenced by full compliance with standards CAN/CSA-C22.2 No. 61010-1-04 and UL Std. No. 61010-1 (2nd Edition).

GOST-R certificate, Rostekhnadzor operation permission and pattern approval certificate for measuring instruments are available for the analysis system.

Technical Data

Measured Components and Measuring Ranges

FTIR ¹⁾	Min. Range	LOD	Min. Range	LOD
SO ₂	0–75 mg/m ³	0.27 mg/m ³	0–25 ppm	0.09 ppm
NO	0–200 mg/m ³	1.65 mg/m ³	0–150 ppm	1.24 ppm
NO ₂	0–40 mg/m ³	0.41 mg/m ³	0–20 ppm	0.2 ppm
CH ₄	0–100 mg/m ³	0.72 mg/m ³	0–150 ppm	1.1 ppm
N ₂ O	0–50 mg/m ³	0.25 mg/m ³	0–25 ppm	0.13 ppm
NH ₃	0–15 mg/m ³	0.20 mg/m ³	0–20 ppm	0.27 ppm
HCl	0–15 mg/m ³	0.26 mg/m ³	0–10 ppm	0.16 ppm
HF	0–5 mg/m ³	0.12 mg/m ³	0–5 ppm	0.13 ppm
CO	0–75 mg/m ³	0.23 mg/m ³	0–60 ppm	0.18 ppm
H ₂ CO	0–20 mg/m ³	0.35 mg/m ³	0–15 ppm	0.26 ppm
CH ₃ OH	0–40 mg/m ³	0.75 mg/m ³	0–30 ppm	0.53 ppm
H ₂ O	0–40 Vol%	0.01 Vol%		
CO ₂	0–30 Vol%	0.01 Vol%		

FID ²⁾	Min. Range	LOD
VOC	0–15 mg/m ³	0.3 mg/m ³

O ₂ Sensor	Range	LOD
O ₂	0–25 Vol%	0.20 Vol%

1) FTIR spectrometer performance is based on 120 seconds data acquisition time, standard deviation 3 σ and optical path length 6.4 m.

2) The measuring range can be reduced or enlarged by a factor of max. 4 (to the smallest indicated measuring range).

Measuring ranges within ignition limits cannot be provided.

Other measured components and measuring ranges on request.

Performances

Cross-sensitivity
< ± 4 % of the smallest measuring range

Linearity
< ± 2 % of the smallest measuring range

Sensitivity drift
< 4 % in 6 months

Zero drift
Corrected automatically

Response time
T₉₀ < 150 seconds, display refreshment time < 40 seconds

Temperature drift
< ± 2 % of the smallest measuring range per 10 K change

Air pressure influence
None (automatically controlled through the aspirator pump module)

Technical Data

System Design

Design

Free standing cabinet in sheet metal
Air conditioning unit optional

Protection class

IP54/NEMA 3 and 13

Dimensions

800 x 2100 x 600 mm (W x H x D)

Weight

Approx. 300 kg

Color

Light gray (RAL 7035)

Minimum distances for installation

Left approx. 500 mm for the cable connections
Right approx. 1000 mm for the pipe connections, air conditioning unit and air purifier
Front approx. 1000 to open the door (hinged at left)
Top approx. 500 mm when using the air conditioning unit (optional)

Input, Output and Status Signals

Measured signals

4–20 mA per measured component
optional: Modbus, Profibus, Ethernet communication

Status signals

Output and status signals from the measured concentrations, gas transport, sample conditioning system and operation are displayed on the built-in LCD display
Status signals: System failure, maintenance mode, maintenance request, module error, oxygen analyzer error, VOC analyzer error

Input signals

Analog and digital signals possible

Gas Connections

Sample gas inlet

Special support for heated line in the right cabinet wall
Screw fitting at SC-block for heated line TBL01 (4/6 x 1 mm)

Sample gas outlet

Screw fitting (steel) for pipe 12 mm

Test gases

Screw fittings for hose (PTFE) 4/6 x 1 mm

Instrument air

Connected to the aspirator pumps and compressed-air purification unit (hose 4/6 x 1 mm).
Quality: Based on ISO 8573-1 Class 2 (max. particle size 1 µm, max. particle density 1 mg/m³, max. oil content 0.1 mg/m³, max. pressure dew point –20 °C). The requirement is for compressed air at 5–7 bar (70–100 psi), up to 1700 l/h (1 cfm) for the FTIR spectrometer, additionally 1400 l/h (0.8 cfm) for the optional VOC analyzer.

Power Supply

Input voltage

230/400 V 3 Ph, N, PE or 120/208 V 3 Ph, N, PE,
± 10 %, 48 to 62 Hz
Non-floating PEN conductor not allowed.

Power consumption

System incl. probe filter	at power-up	approx. 2400 W
	during operation	approx. 1600 W
Heated sampling line		approx. 90 W/m
Air conditioning unit (optional)		approx. 1400 W
Prepared for UPS (optional)		approx. 600 W

Overvoltage category/Pollution degree

II/2

Service socket

230 VAC or 120 VAC, 48 to 62 Hz, max. 5 A
(located in the cabinet light)

Sample Gas Inlet Conditions

Temperature

Controlled at 180 °C ± 2 °C via heated sample gas line

Pressure

Analysis cabinet inlet to sample gas conditioning block:
900–1100 hPa (0.9–1.1 bar)

Flow rate

Approx. 250 l/h

Environmental Conditions

Ambient temperature

In operation	
In air conditioned rooms	+20 to +25 °C
With air conditioning unit (optional)	+5 to +40 °C
During storage and transport	–25 to +65 °C

Relative humidity

≤ 75 % as an annual average, max. 95 % for short periods, occasional and light condensation is permissible, supposed powered and purged system

Installation location

The analysis system is intended for indoor use only. The analysis system should be protected against radiated heat, heavy concentrations of dust, corrosive atmospheres and vibrations.

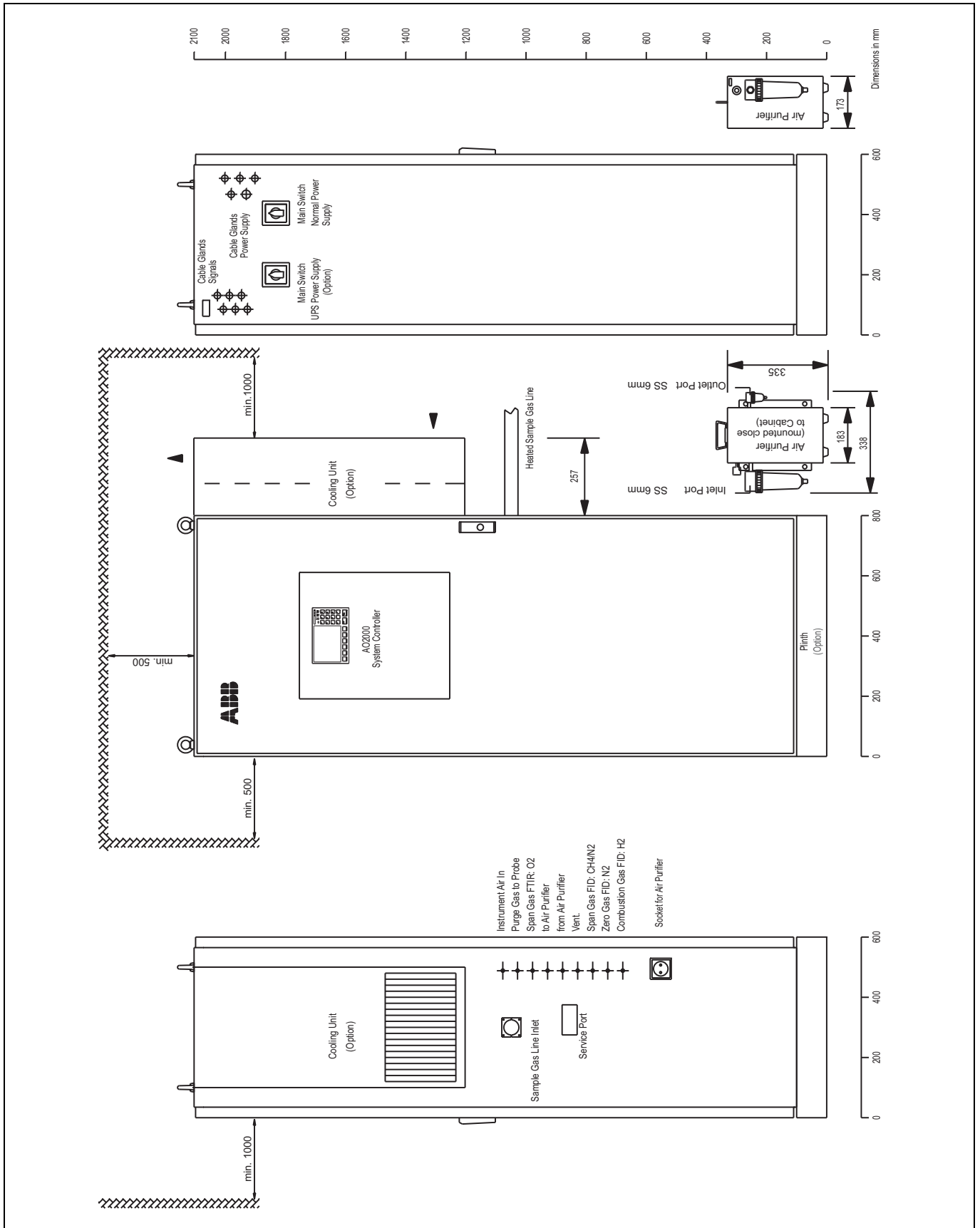
Installation location altitude

Max. 800 m above sea level (for length of sample gas line incl. probe = 10 m); greater altitudes on request.

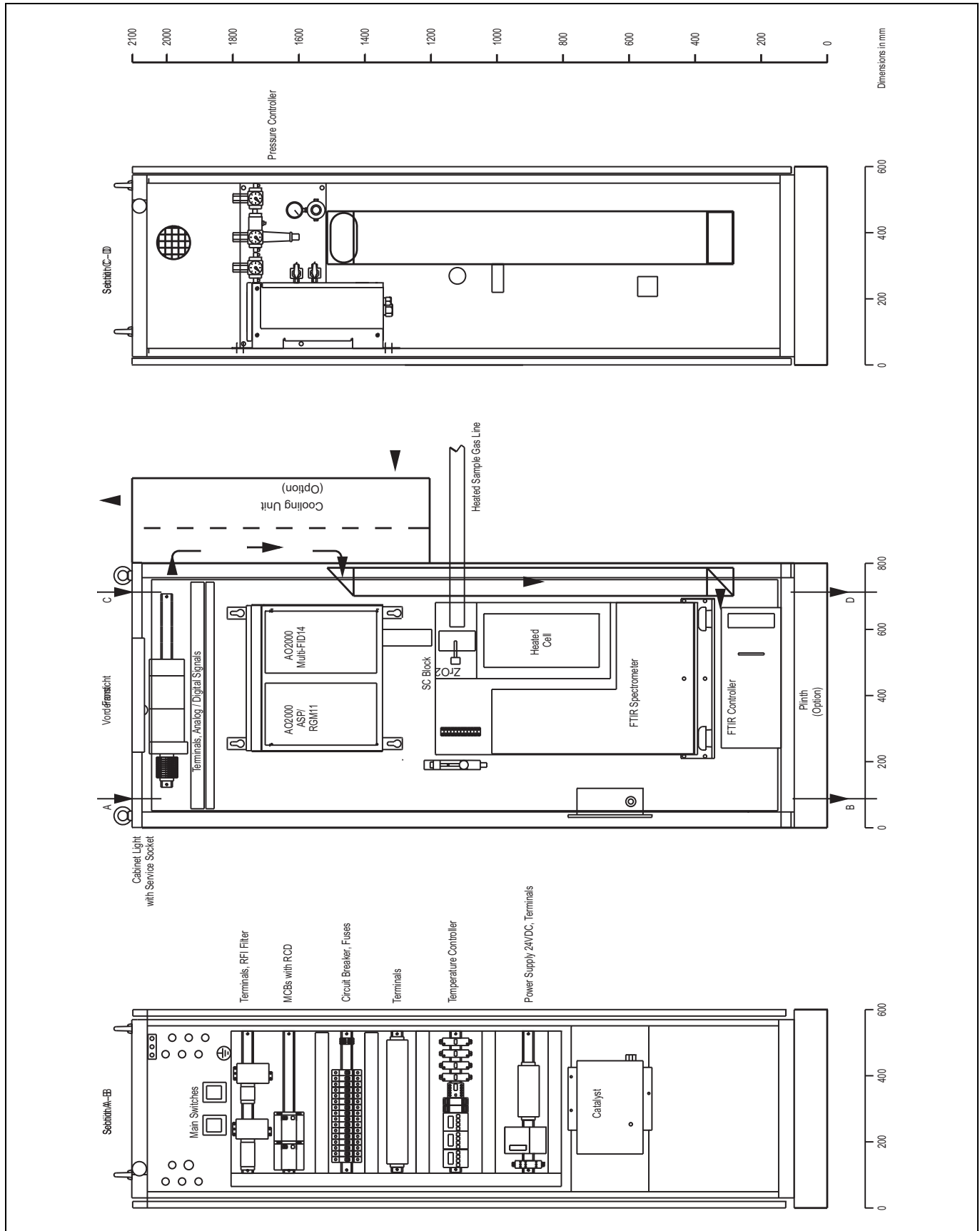
Storage and transport

It is mandatory that the cabinet or the spectrometer is hermetically sealed during storage and transport.

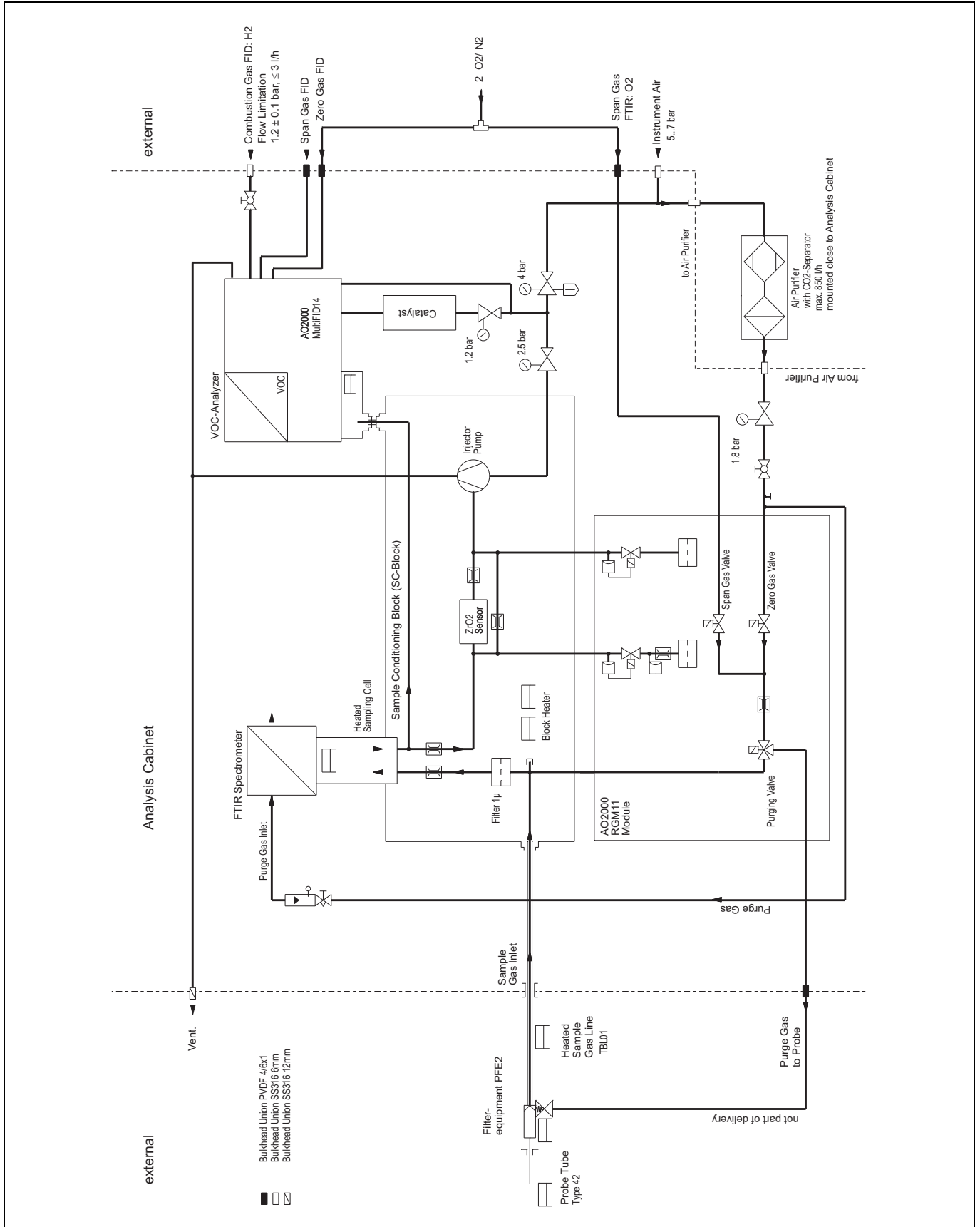
System Design (Exterior View)



System Design (Interior View)



Pneumatics Diagram



Connection Diagram Power Supply

Power Supply
 Fuse-protection external 3x20A (3x25A)
 Cable 5x6 mm² or 5xAWG8
 Cable Gland M32
 (Cable Dia. Range 7-15mm)
 (Supplied by Customer)

UPS Power Supply
 Fuse-protection external 20A
 Cable 3x 2,5 mm² Or 3xAWG10
 Cable Gland M25
 (Cable Dia. Range 6-13mm)
 (Supplied by Customer)

Sample
 Heater Sample Tube Type 42(-E11)
 Cable 3x2,5 mm² or 3xAWG14
 Cable Gland M25
 (Cable Dia. Range 6-13mm)

Cable 3x0,75 mm² or 3xAWG16
 Cable Gland M20
 (Cable Dia. Range 5-10mm)

Connection via Terminal Box on-site

Sample
 Heater Filter Unit (-E12)
 Cable 3x1,5 mm² or 3xAWG16
 Cable Gland M20
 (Cable Dia. Range 5-10mm)

Cable 3x0,75 mm² or 3xAWG16
 Cable Gland M20
 (Cable Dia. Range 5-10mm)

Connection via Terminal Box on-site

Heated Sample Line TBL01 (-E13)
 Cable 3x2,5 mm² or 5x2,5mm²
 Cable 3xAWG12 or 5xAWG12
 Cable Gland M25
 (Cable Dia. Range 6-13mm)

Cable 3x0,75 mm² or 3xAWG16
 Cable Gland M20
 (Cable Dia. Range 5-10mm)

Air Purifier (-E05)
 via delivered
 Plug Power Supply (-G05)

230V AC or 120V AC, 48...62Hz, max.5A

CAUTION: max. Length of Sample Gas Line at 230/400V:
 35m - 1-phase Fuse-protection (Standard)
 60m - 3-phase Fuse-protection
CAUTION: max. Length of Sample Gas Line at 120/208V:
 15m - 1-phase Fuse-protection (Standard)
 40m - 3-phase Fuse-protection



Power Supply
 230/400V +/-10%, 48...62Hz
 (120/208V +/-10%, 48...62Hz)

-X10
 1 0 L1
 2 0 L2
 3 0 L3
 4 0 N
 PE 0 PE

-X20
 1 0 L1
 2 0 N
 PE 0 PE

Heating
 -X01
 10 0
 11 0
 12 0

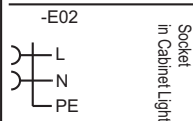
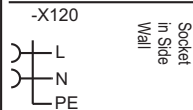
Temperature Sensor
 -X02
 1 0
 2 0
 3 0

Heating
 -X01
 13 0
 14 0
 15 0

Temperature Sensor
 -X02
 4 0
 5 0
 6 0

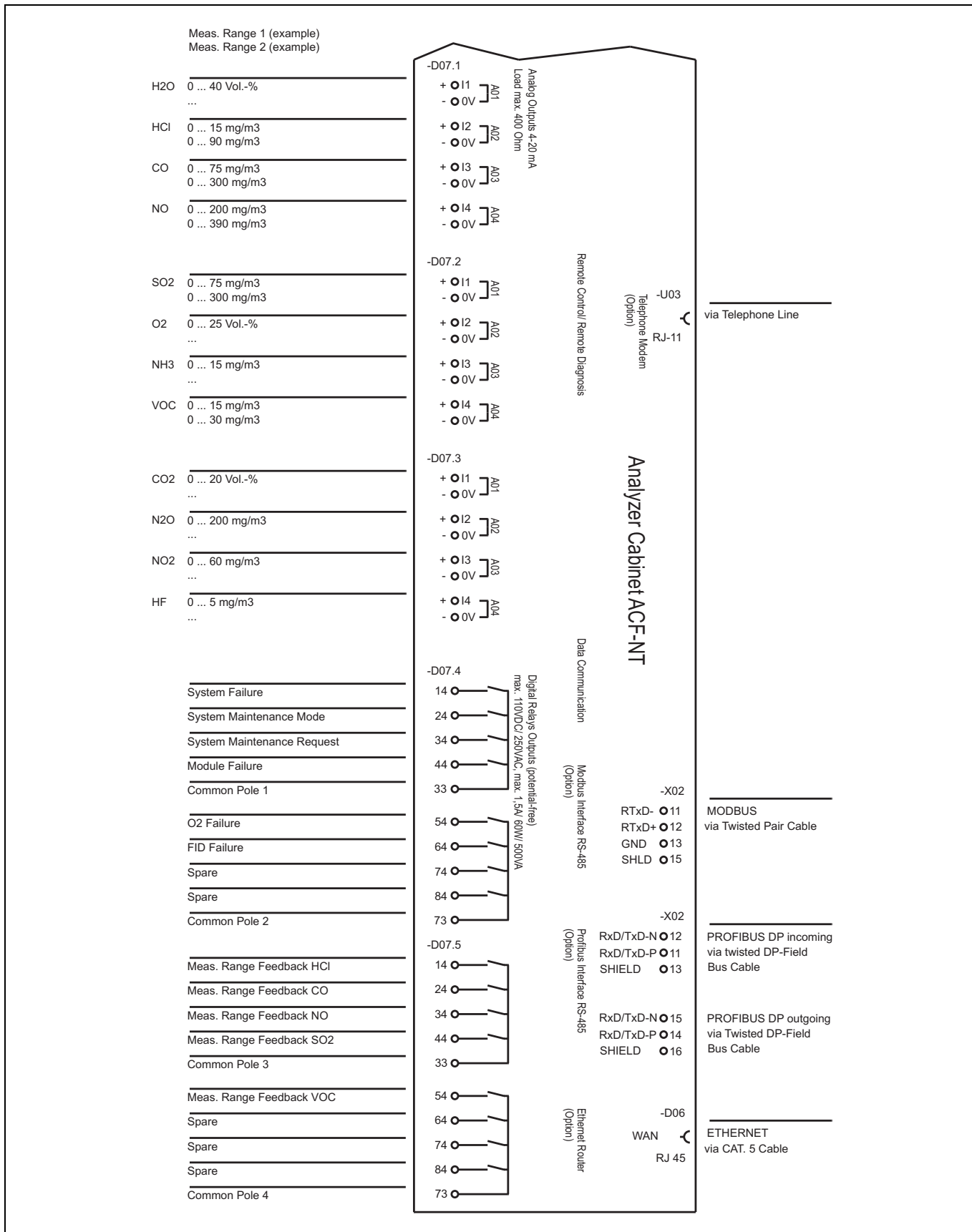
Heating
 -X01
 16 0
 19 0
 22 0
 17 0
 18 0

Temperature Sensor
 -X02
 7 0
 8 0
 9 0



Analyzer Cabinet ACF-NT

Connection Diagram Signal Lines



Ordering Information

Serial interface for measurement values and status signals														
<i>Especially in Germany, the end user must clarify the admissibility of serial data transmission with the responsible inspecting authority and the acceptance authority prior to serial data transmission.</i>														
Without														0
Modbus (line length max. 1200 m)														1
Modbus via fiber optic cable (line length max. 3500 m)														2
Profibus (line length max. 1200 m)														3
Ethernet (line length max. 100 m)														4
Ethernet and Modbus (line length Ethernet max. 100 m, Modbus max. 1200 m)														5
Ethernet and Modbus via fiber optic cable (line length max. 3500 m)														6
Ethernet and Profibus (line length Ethernet max. 100 m, Profibus max. 1200 m)														7
Ethernet and Profibus via fiber optic cable (line length max. 3500 m)														8
<i>Modbus: The RS485 interface of the AO2000 system controller is used for the transmission and connected to terminals. Twisted-pair cables can be used for line lengths up to 1200 m. The option Modbus via optical fiber must be selected for line lengths from 1200 m to 3500 m. In this case, the RS232 signal of the AO2000 is converted to optical fiber by means of an interface. The transmission is protocol-independent, i.e. the Modbus master can be set to RS485. The Modbus master must read the physical measured values and the status signals. When placing an order, the Modbus address of the ACF-NT in the customer's network should be specified with the Suppl. No. MBS 3 weeks before completion at the latest.</i>														
<i>Profibus: The floating RS485 Profibus-DP interface of the AO2000 system controller is used for the transmission and connected to terminals. The line length can be a max. 1200 m with standard cables. Fiber optic cables permit greater lengths. The maximum possible length is primarily dependent on the transmission rate and the number of repeaters, which may be series-connected. The local network conditions are decisive. Serial integration in the plant network is possible; the terminating resistor must be set accordingly during the commissioning. The Profibus master must read the physical measured values and the status signals. When placing an order, the Profibus address of the ACF-NT in the customer's network should be specified with the Suppl. No. PBS 3 weeks before completion at the latest.</i>														
<i>Ethernet: For reasons of security, data transmission takes place via a router which has been set, so that only access to the AO2000 database in the system controller is permitted. A possible virus attack on the FTIR controller is thereby prevented. For this purpose, either AO2000 OPC server or AnalyzeIT Explorer must be installed, in order to be able to read out data. These programs must be ordered separately. An OPC client must be provided by the customer for integration in the process control system. Cables with the specification CAT5 with RJ45 connections can be used for line lengths up to 100 m. Fiber optic cables with suitable converters must be used for cable lengths over 100 m. Cables and converters are not supplied. The entire internal data traffic is open in this type of connection, so that exceptional care must be taken in the selection of the data which is to be read. Under no circumstances may the AO2000 database be written to! When placing the order, the TCP/IP address, the subnet mask and the gateway address of the ACF-NT in the customer's network with the Suppl. Nos. IPT, IPS and IPG should be specified 3 weeks before completion at the latest.</i>														

Ordering Information

Serial interface for local operation and remote diagnosis															
Without															0
Telephone modem, analog															1
<i>For remote control and fault diagnosis via analog telephone network</i>															
Ethernet, connection RJ45 (line length max. 100 m)															2
<i>For direct operation of the system for service purposes. The system can be taken control of by an external laptop which is integrated in the internal Ethernet network of the ACF-NT.</i>															
Ethernet, connection RJ45 + telephone modem, analog															3
Telephone modem ISDN															6
<i>For remote control and fault diagnosis via ISDN telephone network (D-channel protocol DSS1; Euro ISDN). The modem is configured, so that remote access via analog modem is also possible. In this case, however, the transmission rate is limited to 14400 Kb/s.</i>															
Ethernet, connection RJ45 + telephone modem ISDN															7
Sampling & conditioning															
Without probe tube															0
Probe tube 40 not coated, stainless steel (1.4571)															
<i>Standard probe tube of stainless steel, material no. 1.4571, max. 500 °C. Other versions of the probe tube, e.g. higher temperatures, are possible.</i>															
Nominal length 500 mm															1
Nominal length 1000 mm															2
Nominal length 1500 mm															3
Nominal length 2000 mm															4
Nominal length 2500 mm															5
Probe tube 42 heated															
<i>Application for sample gas temperatures around or below the dew point. The heating of the probe tube is regulated. The power supply and the regulation system are installed in the analyzer cabinet.</i>															
Nominal length 1000 mm, with temperature controller															B
Nominal length 1500 mm, with temperature controller															C
Nominal length 2000 mm, with temperature controller															D
Prepared for heated probe tube, with temperature controller															E
<i>The heated probe tube is ordered separately. However, the electrical supply (max. 800 VA) for heating the probe tube and the temperature controller are provided in the analyzer cabinet.</i>															

Ordering Information

Filter unit														
<i>The filter unit is a PFE2 with a 0.3 µm filter. A check valve is installed at the actual test gas connection. Test gas can thereby be fed via the probe. In the case of a temperature error, emergency purging with dry air from the system takes place via this path. The emergency purging line (PTFE 4/6 x 1 mm) is not supplied.</i>														
<i>Protective box: If the sampling point is outside an enclosed building, a protective box is mandatory.</i>														
<i>Back-purging: Application for sample gas with a high dust load. Filter unit PFE2 with valve assembly for the two-step back-purging of the filter and probe tube by means of compressed air pulses, incl. control by system controller. An additional heated 3/2 directional solenoid valve shuts off the sample gas feed path during the purge-back and lets ambient air into the system, in order not to disturb the negative pressure regulation of the ACF-NT.</i>														
Without filter unit, but with temperature controller														0
<i>The filter unit PFE2 is ordered separately. However, the electrical supply (max. 400 VA) for heating the filter unit and the temperature controller are provided in the analyzer cabinet.</i>														
Filter unit PFE2 without protective box, with heating sleeve 230 V and insulation, 1 x Pt100, with test/emergency purging valve (Catalog No. 23028-0-172231)														1
Filter unit PFE2 with protective box, with heating sleeve 230 V and insulation, 1 x Pt100, with test/emergency purging valve (Catalog No. 23028-0-272231)														2
Filter unit PFE2 without protective box, with heating sleeve 115 V and insulation, 1 x Pt100, with test/emergency purging valve (Catalog No. 23028-0-172232)														3
Filter unit PFE2 with protective box, with heating sleeve 115 V and insulation, 1 x Pt100, with test/emergency purging valve (Catalog No. 23028-0-272232)														4
Filter unit PFE2 with protective box, with heating sleeve 230 V and insulation, 1 x Pt100, with two-stage back-purging, test/emergency purging valve, heated check valve (Catalog No. 23028-0-272261)														7
Filter unit PFE2 with protective box, with heating sleeve 115 V and insulation, 1 x Pt100, with two-stage back-purging, test/emergency purging valve, heated check valve (Catalog No. 23028-0-272262)														8

Ordering Information

Heated sample gas line																				
<p>The sample gas line is a TBL01-S with a heating power of 90 W/m and a gas hose line PTFE 6/8 x 1 mm. Connecting pieces: metal nipple 4/6 x 1 mm; metal cap connector on the probe and cabinet side; external sheath PA annularly corrugated hose; feeder and Pt100 line hardwired with 5 m connecting cable. Important: The sample gas line may not be shortened.</p>																				
without sample gas line, but with temperature controller for line lengths up to 35 m																		0		
<p>With electrical supply and regulation for separately supplied sample gas line. The electrical supply is single-phase and fuse-protected up to 3150 VA with 230 V or 1350 VA with 115 V. As a result, heated lines up to 15 m can be connected with 115 V and up to 35 m with 230 V.</p>																				
Sample gas line TBL01-S with heating 230 V, length up to 35 m (see Suppl. No. 903) (Catalog No. 23283-0-431A15)																		1		
<p>Single-phase supply; fuse protection max. 3150 VA. Specification of the line length together with Suppl. No. 903.</p>																				
Sample gas line TBL01-S with heating 230 V, length 35–60 m (see Suppl. No. 903) (Catalog No. 23283-0-431A17)																		2		
<p>3-phase supply; fuse protection max. 5400 VA. Specification of the line length together with Suppl. No. 903.</p>																				
Sample gas line TBL01-S with heating 115 V, length up to 15 m (see Suppl. No. 903) (Catalog No. 23283-0-431A16)																		3		
<p>Single-phase supply; fuse protection max. 1350 VA. Specification of the line length together with Suppl. No. 903.</p>																				
Sample gas line TBL01-S with heating 115/200 V, length 15–40 m (see Suppl. No. 903) (Catalog No. 23283-0-431A18)																		4		
<p>3-phase supply; fuse protection max. 3600 VA. Specification of the line length together with Suppl. No. 903.</p>																				
Prepared for heated sample gas line 230/400 V, length up to 60 m																		5		
<p>3-phase supply; fuse protection max. 5400 VA. For line length 35 to 60 m. This option can be selected if the length of the sample gas line is not yet known when placing the order.</p>																				
Prepared for heated sample gas line 115/200 V, length up to 40 m																		6		
<p>3-phase supply; fuse protection max. 3600 VA. For line length 15 to 40 m. This option can be selected if the length of the sample gas line is not yet known when placing the order.</p>																				
Power supply																				
<p>Three-phase AC connection; N conductor and protective conductor (PE) required. A non-floating PEN conductor is not permitted. Prepared for UPS: The most important load consumers, e.g. FTIR controller, FTIR spectrometer, system controller, compressed-air drier and 24 V power supply unit, are supplied with power via a second supply. The uninterruptible power supply (UPS) is provided by the end user. The power consumption is approx. 600 VA.</p>																				
230/400 V, 48 to 62 Hz, without UPS																		1		
115/200 V, 48 to 62 Hz, without UPS																		2		
230/400 V, 48 to 62 Hz, prepared for UPS																		4		
115/200 V, 48 to 62 Hz, prepared for UPS																		5		

Additional Ordering Information

	Suppl. No.
Measuring component HCl	910
Range 1: 0 to ... mg/m ³ or ppm	911
Range 2: 0 to ... mg/m ³ or ppm	912
Measuring component CO	920
Range 1: 0 to ... mg/m ³ or ppm	921
Range 2: 0 to ... mg/m ³ or ppm	922
Measuring component SO ₂	930
Range 1: 0 to ... mg/m ³ or ppm	931
Range 2: 0 to ... mg/m ³ or ppm	932
Measuring component NO	940
Range 1: 0 to ... mg/m ³ or ppm	941
Range 2: 0 to ... mg/m ³ or ppm	942
Range switchover	945
<i>only for measuring components HCl (15/90 mg/m³), CO (75/300 mg/m³), SO₂ (75/300 mg/m³) and NO (200/392 mg/m³)</i>	
Measuring component H ₂ O	950
Range: 0 to ... Vol%	951
Measuring component O ₂	955
Range: 0 to ... Vol%	956
Measuring component org. C _{total} (VOC)	960
<i>Range switchover ratio max. 1:4</i>	
Range 1: 0 to ... mg/m ³ or ppm	961
Range 2: 0 to ... mg/m ³ or ppm	962
Measuring component NH ₃	965
Range: 0 to ... mg/m ³ or ppm	966
Measuring component CO ₂	970
Range: 0 to ... Vol%	971
Measuring component NO ₂	975
Range: 0 to ... mg/m ³ or ppm	976
Measuring component N ₂ O	980
Range: 0 to ... mg/m ³ or ppm	981
Measuring component HF	985
Range: 0 to ... mg/m ³ or ppm	986
Measuring component NO _x (NO + NO ₂ calculated as NO ₂)	991
Range: 0 to ... mg/m ³ or ppm	992
Measuring component CH ₄	995
Range: 0 to ... mg/m ³ or ppm	996
Measuring component H ₂ CO	915
Range: 0 to ... mg/m ³ or ppm	916
Measuring component CH ₃ OH	925
Range: 0 to ... mg/m ³ or ppm	926

Additional Ordering Information

		Suppl. No.
Heated sample line TBL01-S length ... m (observe max. length)		903
<i>Specify the exact line length. Take account of the maximum possible length here. Important: The TBL01-S may not be shortened!</i>		
Special version		300
Parameter definition of the software		
Measured values referenced to dry basis (humidity correction)		430
<i>Humidity correction calculation and output of the measured pollutant values referenced to 273 K. Combination with O₂ correction value calculation possible.</i>		
O ₂ correction value calculation, specify reference value (... Vol% O ₂)		431
<i>A correction calculation and output of the measured pollutant values to the specified oxygen value take place. Combination with humidity correction calculation possible.</i>		
Connection of an external analyzer to the heated sampling system		449
<i>A transfer for the connection of a further analyzer is provided at the heated connection block. The end user is responsible for the correct functioning of downstream analyzers. Important: It must be ensured that gas is not blown back into the measuring system via the sample gas line as a result of downstream instruments at any time, in order to prevent damage to the instrument and malfunctions. This must be taken into account for the operation of downstream analyzers in particular. Here, for example, instrument air could be forced into the sample gas line, resulting in the dilution of the sample gas and an erroneous measurement of the FTIR spectrometer. ABB can also not assume any responsibility if acceptance inspections of the TÜV/authority are not issued, because measurements which require separate sampling for their approval for use according to the 13th or 17th Federal Regulation on Immissions have been coupled.</i>		
Daily drift check		450
<i>Provided for use in accordance with the EPA directives, which require a daily automatic drift test. Up to three test gas cylinders can be connected. The process control system can compare the measured test gas values with the set points and detect any deviations.</i>		
Language for user interface	German	451
	English	452
Documentation		
System manual (1 pc free)	German	G31
	English	G32
Drawings (layout, piping and electrical) on CD-ROM	PDF format	PDF
	DXF format	DXF
	DWG format	DWG
Addresses for serial data transfer <i>ACF-NT addresses in customer network</i>	TCP/IP address	IPT
	Subnet mask	IPS
	Gateway address	IPG
	Modbus	MBS
	Profibus	PBS
CSA Approval		CSA
GOST Approval		CA3

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