Instruction Manual
ETC01035
08/2005

Instruction Manual

BINOS 100 F & MLT 2
Addendum for Pressurized Analyzers intended to be used in Hazardous Areas
Zone 1: All Versions
Zone 2: Non-Flammable Gases Only

4th Edition 08/2005

ROSEMOUNT® Analytical

EMERSON™ Process Management

www.EmersonProcess.com

ESSENTIAL INSTRUCTIONS

READ THIS PAGE BEFORE PROCEEDING!

Emerson Process Management (Rosemount Analytical) designs, manufactures and tests its products to meet many national and international standards. Because these instruments are sophisticated technical products, you **MUST properly install, use, and maintain them** to ensure they continue to operate within their normal specifications. The following instructions **MUST be adhered to** and integrated into your safety program when installing, using and maintaining Emerson Process Management (Rosemount Analytical) products. Failure to follow the proper instructions may cause any one of the following situations to occur: Loss of life; personal injury; property damage; damage to this instrument; and warranty invalidation.

- **Read all instructions** prior to installing, operating, and servicing the product.
- If you do not understand any of the instructions, **contact your Emerson Process Management (Rosemount Analytical) representative** for clarification.
- **Follow all warnings, cautions, and instructions** marked on and supplied with the product.
- **Inform and educate your personnel in the proper installation, operation, and maintenance of the product**.
- **Install your equipment as specified in the Installation Instructions of the appropriate Instruction Manual and per applicable local and national codes**. Connect all products to the proper electrical and pressure sources.
- To ensure proper performance, **use qualified personnel** to install, operate, update, program, and maintain the product.
- When replacement parts are required, ensure that qualified people use replacement parts specified by Emerson Process Management (Rosemount Analytical). Unauthorized parts and procedures can affect the product's performance, place the safe operation of your process at risk, **and VOID YOUR WARRANTY**. Look-alike substitutions may result in fire, electrical hazards, or improper operation.
- **Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified persons, to prevent electrical shock and personal injury**.

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4th Edition 08/2005

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PREFACE

The purpose of this manual is to provide additional information concerning the components, functions, installation and maintenance of EEx p pressurized MLT 2 and BINOS® 100 F analyzers intended to be installed and operated at hazardous locations. The analyzers are EC type certified, documented by the EC Type Examination Certificates

LCIE 03 ATEX 6010 X and LCIE 03 ATEX 6011 X

The user should become thoroughly familiar with the operation of this equipment before operating it.

Some sections may describe equipment not used in your configuration.

This ATEX instruction manual is a supplement to the analyzers standard instruction manual! In addition to this manual, the manuals of all devices necessary for operating the system must be observed. Read all manuals completely to be familiar with the operation of this equipment at hazardous locations.

Some technical specifications in this manual may be different to those in the associated manuals for the analyzers and additional equipment. In this case the technical specifications listed in this manual are valid only.

DEFINITIONS

The following definitions apply to WARNINGS, CAUTIONS and NOTES found throughout this publication.

WARNING

Highlights an operation or maintenance procedure, practice, condition, statement, etc. If not strictly observed, could result in injury, death, or long-term health hazards of personnel.

CAUTION

Highlights an operation or maintenance procedure, practice, condition, statement, etc. If not strictly observed, could result in damage to or destruction of equipment, or loss of effectiveness.

NOTE

Highlights an essential operating procedure, condition or statement.

IMPORTANT

SAFETY INSTRUCTIONS

SAFETY SUMMARY

If this equipment is used in a manner not specified in these instructions, protective systems may be impaired.

WARNING

DANGER TO LIFE !

Before installing, operating or working at Products described in this manual read this and all other related manuals!

WARNING

EXPLOSION HAZARD !

Instruments described in this manual are intended to be installed and operated at hazardous locations. Doing so may be permitted only taking into account special legal conditions not described in this manual!

Ensure all safety devices and the pressurization unit are safe and operating properly to operate the analyzers in a safe manner!

Failure to follow the proper instructions may cause an explosion!

WARNING

DANGER TO LIFE !

Products described in this manual are not designed for use in any life support and/or safety equipment where failure to perform can reasonably be expected to result in personal injury or death.

WARNING

EXPLOSION HAZARD !

Products described in this manual shall not be supplied with explosive gases!

WARNING

EXPLOSION HAZARD !

Instruments inclusive EEx p unit may weigh up to 40 kg (depending on installed options)!

Do not use the attached EEx p unit or the external valve as a handle for transportation or lifting the instrument! Failure to follow may loosen or damage the devices and impair the safety of the whole instrument!

WARNING

EXPLOSION HAZARD !

When the analyzer is out of order or if the pressurization unit shuts off all non-intrinsically safe inputs and outputs connected to external equipment MUST be shut off too!

This ensures that no hazardous voltages are present within the analyzer enclosure when not pressurized.

AUTHORIZED PERSONNEL

To avoid loss of life, personal injury and damage to this equipment and on-site property, do not operate or service this instrument before reading and understanding this instruction manual and receiving appropriate training.
SAVE THESE INSTRUCTIONS FOR FUTURE USE.

TERMS USED IN THIS MANUAL

ATEX
Directive 94/9/EC, commonly called the ATEX („Atmosphères Explosibles“) products directive.

Area Classification

Zone 1
Where ignitable concentrations of flammable gases can exist some of the time under normal operating conditions.
(A guideline value [not part of a standard] is 10 to 1.000 hours per year.)
Equipment to be used in Zone 1 has to be classified Category 2.

Zone 2
Where ignitable concentrations of flammable gases are not likely to exist under normal operating conditions.
(A guideline value [not part of a standard] is less than 10 hours per year.)
Equipment to be used in Zone 2 has to be classified Category 3.

Explosion Protection

External Explosion Protection
The „External explosion protection“ serves to prevent penetration of explosive gas mixtures into the analyzer enclosure. In addition it avoids ignition on the surface. For this reason the analyzer is purged with protective gas and held at an internal overpressure compared to the surrounding atmosphere.

Internal Explosion Protection
The „Internal explosion protection“ serves to prevent ignition of gas being present in the analyzer’s Containment System (CS; = sample gas path).
Dependent on the gas composition several options are available:
- None required (if gas is noncombustible),
- dilution by purge gas

and/or
- internal overpressure of the analyzer’s enclosure compared to the CS.

Containment System
The part of the analyzer containing the gas that may constitute an internal source of release.

Lower Explosion Limit (LEL)
Volume ratio of flammable gas in air below which an explosive gas atmosphere will not be formed: the mixture of gas and air lacks sufficient fuel (gas) to burn.

Upper Explosion Limit (UEL)
Volume ratio of flammable gas in air above which an explosive gas atmosphere will not be formed: the mixture of gas and air is too rich in fuel (deficient in oxygen) to burn.

Terms used in this manual

Protective Gas
Air or inert gas used for purging and maintaining an overpressure and, if required, dilution.

Pre-Purging
The pre-purging phase serves to remove any combustible gas out of the analyzer's enclosure prior to switching on the analyzer.

Pressurization modes

„Continuous Flow“
In EEx p „continuous flow mode“ the protective gas flows with higher rates through the enclosure. Flow rates are calculated to hold an overpressure of $\geq$ 1 mbar compared to atmospheric.

Flammable Gas(es)
Gases and gas mixtures are assigned to be flammable if they might become ignitable when in a mixture with air.

Dilution
The continuous supply of a protective gas, after purging, at such a rate that the concentration of a flammable mixture inside the pressurized enclosure is maintained at a value outside the explosive limits except in a dilution area.

„Leakage Compensation“
In EEx p „leakage compensation mode“ just as much protective gas is used to hold the required overpressure compared to atmospheric.

TABLE OF CONTENTS

SECTION 1
Technical Description

1-1 Application and Principle of Operation

The gas analyzers of type BINOS® 100 F and MLT 2 are intended to measure gas components within gas mixtures. In combination with an appropriate certified pressurization system (protection method „Pressurized Enclosure“ EEx p) they can be installed and operated in hazardous areas of Category 2 or Category 3.
Pressurization acts as external explosion protection and prevents external explosive atmosphere to penetrate into the analyzer by holding the enclosure at an overpressure compared to the surrounding
The type of purge system used varies dependent on the area where the analyzer is intended to be installed. Both systems offer two modes of operation:

- EEx p with continuous flow

and

- EEx p with leakage compensation.

Dependent on the sample gas composition it may be necessary to take care of internal explosion protection which refers to the sample gas path (containment system) in the analyzer.

One of the following protection methods is used:

- **Nonflammable gases and gas mixtures** below the LEL: It must be ensured that the sample gas in the containment system always remains below the lower explosive limit!
- **Flammable gases and gas mixtures** may be analyzed using an analyzer with pressurization method „leakage compensation“ when the sample gas is diluted below ¼ LEL outside the analyzer, so the resulting sample gas is to be categorized „nonflammable“. The diluting system must ensure that the gas in the containment system always remains below ¼ LEL.
- **Flammable gases and gas mixtures** may be analyzed using an analyzer with pressurization method „leakage compensation“ or „continuous flow“ when the analyzer enclosure has an internal overpressure of ≥ 50 Pa over the pressure in the containment system. To ensure this condition a differential pressure switch is used and connected between containment system and analyzer enclosure. In case the pressure decreases below the level of 50 Pa the switch is activated and forces the purging unit to disconnect the analyzer from it’s power supply. If more than one switch is needed because more than one flammable gas is supplied to the analyzer, the contacts of these switches have to be connected in series. Purge medium may be inert gas or air. Flame arrestors are required for all gas inlets and outlets carrying flammable gases.
- **Explosive gases must not be connected to the analyzer!**

1-2 Unused

1-3 Specification

1-3-1 Installation Site

Hazardous area: Zone 1 (Category 2)
or Zone 2 (Category 3),
dependent on purge system

1-3-2 Explosion Protection

Concepts:

Category 2 : Pressurized enclosure (EEx p) with either leakage compensation mode or continuous flow

Category 3: Pressurized enclosure (EEx p) using simplified purge with either leakage compensation mode or continuous flow

Temperature class: T4

Options: Intrinsically safe (EEx i) digital, analog, network or Foundation Fieldbus outputs.

Intrinsically safe (EEx i) paramagnetic Oxygen sensor or thermal conductivity sensor.

Applicable Standards:

EN 50014:1997 + amendments 1 & 2,
EN 50016:1995,
EN 50020:1994

1-3-3 Description of Pressurization Systems

An internal overpressure inside the protected housing prevents outer (possibly explosive) atmosphere to enter.
Instruments intended to be installed in Zone 1 are automatically prepurged before power is supplied. This ensures that all possibly explosive atmosphere present inside the instrument is removed. The prepurge process is controlled by the pressurization control unit which also acitivates switching on the analyzer when the prepurge phase has elapsed.

While the Zone 2 unit mainly consists of a pressure monitor with alarm contacts the Zone 1 unit contains a purge gas inlet valve (proportional valve), a controller unit with microprocessor and an outlet valve (high pressure version only). The controller unit permanently monitors the parameters (e.g. prepurge phase, purge gas flow, internal overpressure, and more) and therefore ensures safe operation. A separate instruction manual provides more detailled information.

The Zone 1 system is available in two differing variations due to different requirements for measuring flammable and non-flammable gases:

Measuring non-flammable gases:
The system provides an internal overpressure of 14 mbar during operation.

Measuring flammable gases:
The standard configuration is designed to hold an internal overpressure of 90 mbar. Optionally 14 mbar may be adjusted if it is ensured that the gas pressure within the Containment System is allways below 12 mbar.
In addition one differential pressure switch is installed within any gas path to ensure the instrument‘s overpressure is always at least 50 Pa (0.5 mbar) above the pressure in the containment system.

Depending on which system is used, different parameters apply:

Application	Mode of Operation	Single Enclosure (volume approx. 56 l)		Dual Enclosure (volume approx. 112 l)
Zone 1	**Prepurge Phase**			
for measuring	Duration:	10 min		14 min
flammable gases	Purge gas consumption:	1,75 Nm³/h		1,92 Nm³/h
	maximum overpressure:	95 mbar		95 mbar
	Measuring Mode			
	Internal overpressure:	90mbar		90 mbar
	Flow rate (leakage rate):	<= 3 l/min		<= 4,5 l/min
Zone 1	**Prepurge Phase**			
for measuring	Duration:	4 min		6 min
non-flammable gases	Purge gas consumption:	6,8 Nm³/h		9,2 Nm³/h
	maximum overpressure:	25 mbar		25 mbar
	Measuring Mode			
	Internal overpressure:	14 mbar		14 mbar
	Flow rate (leakage rate):	<= 3 l/min		<= 4,5 l/min

Application	Mode of Operation	Single Enclosure (volume approx. 56 l)		Dual Enclosure (volume approx. 112 l)
Zone 2	**Prepurge Phase**			
for measuring	Duration:	5 min		17 min
non-flammable gases	Purge gas consumption:	8 Nm³/h		7 Nm³/h
	maximum overpressure:	25 mbar		25 mbar
	Measuring Mode			
	Internal overpressure:	1 mbar		1 mbar
	Flow rate (leakage rate):	<= 22Nm³/h		<= 22 Nm³/h

Minimum overpressure in all enclosures:

- 1 mbar against external atmosphere and
- 50 Pa against containment system when measuring flammable gases

1-3-4 Purge Gas Conditions

Purge gas:
- Inert gas (e.g. Nitrogen)
- Air (from an ex-free zone)

Temperature: As ambient, but **min. 20 °C to 35 °C.**

Medium has to be dry and free from dust, oil, corrosive or aggressive components!

Input pressure at inlet of EEx p device:
- 2.000 to 4.000 hPa (2 to 4 bar)

1-3-5 Sample Gas Conditions

Applicable gases:	Nonflammable gases or gas mixtures which always remain below LEL	Flammable gases
Maximum sample gas pressure:	atmospheric or <1500 hPa at normal atmospheric pressure, dependend on gas measuring principle	atmospheric or <1500 hPa at normal atmospheric pressure, dependend on gas measuring principle **and** overpressure ≤ 85 mbar (optional ≤ 12 mbar) against surrounding atmosphere
Sample gas flow:	for all sample gases refer to the corresponding analyzer data sheet	

1-3-6 Differential Pressure Monitoring

For analyzers connected to flammable gases (either sample gas or span gas) the operator needs to ensure that the pressure within the containment system always remains at minimum 50 Pa below the pressure within the analyzer enclosure. This ensures that in case of a leak the flammable gas does not enter the enclosure.
An additional differential pressure switch must be provided to monitor the pressure difference. The switch's electric contact has to be connected to the purge system. In case the pressure difference decreases below 50 Pa the contact opens and the purge system shuts down the analyzer.
The limit of 50 Pa is the least permissible value given by the standards, higher values are acceptable, too.
Flame arrestors are required for gas inlets and outlets.
Electrical and mechanical connections are shown in section 2 „Installation".

1-3-7 Equivalent Safety Devices

WARNING

It is recommended to order and use the pressurization systems provided and specified by Emerson Process Management.

It is the responsibility of the operator/owner to choose and install a pressurization system other than recommended by Emerson Process Management!

In no case Emerson Process Management is held responsible for any damage, personal injury etc. resulting from choosing different pressurization systems!

In principle it is possible to use other equivalent pressurization systems as described in this manual, as long as they meet the following requirements:

- Device is ATEX approved
- Adjustable pre-purge phase
- Minimum purge flow rate :
  7 Nm^3/h resp. 8 Nm^3/h
- Limited purge gas pressure during the pre-purging phase: < 25 mbar
- Input pressure for purge gas supply:
  2 ... 4 bar
- Relay contacts for all-pole disconnection of the analyzer from power supply
- Relay contacts for disconnecting additional external equipment
- Connection facility for bypass key switch, providing intrinsically safe signal for scanning the key switch
- **For units connected to flammable gases, only:**
  Connection facility for differential pressure switch, providing intrinsically safe signal for scanning the switch

1-4 Additional Safety Measures

- Exhaust gas lines must end outside the hazardous area at a safe point. Sample gas lines may be returned to the sampling point.
- If gas exhaust lines end within the hazardous area gas inlet and outlet have to be equipped with flame arrestors.
- The maximum permissible gas pressure depends on the type of connected gas. See section 1-3-5 for detailed information.

SECTION 2
Installation

WARNING

Before starting to install this equipment, read the corresponding sections of the analyzer's instruction manual and the manuals of the additional equipment! Failure to follow the safety instructions could result in serious injury or death.

2-1 General

Proper functioning of the Emerson Process Management gas analyzers depends on proper installation. All procedures in this section, in the corresponding sections of the analyzer instruction manual and the manuals of the attached safety devices must be followed carefully.

2-2 Installation of the Unit

Install the assembled unit as described in the analyzer's instruction manual: Refer to the dimensional drawings in this manual (fig. 2-1a/b and 2-2a/b) to ensure the designated location is dimensioned sufficiently.

WARNING

Instruments inclusive EEx p unit may weigh up to 40 kg (depending on installed options)! Use two person and/or suitable tools for transportation and lifting these instruments!

CAUTION

Take care to use anchors and bolts specified to be used for the weight of the units!

Take care the wall or stand the unit is intended to be installed at is solid and stable to hold the units!

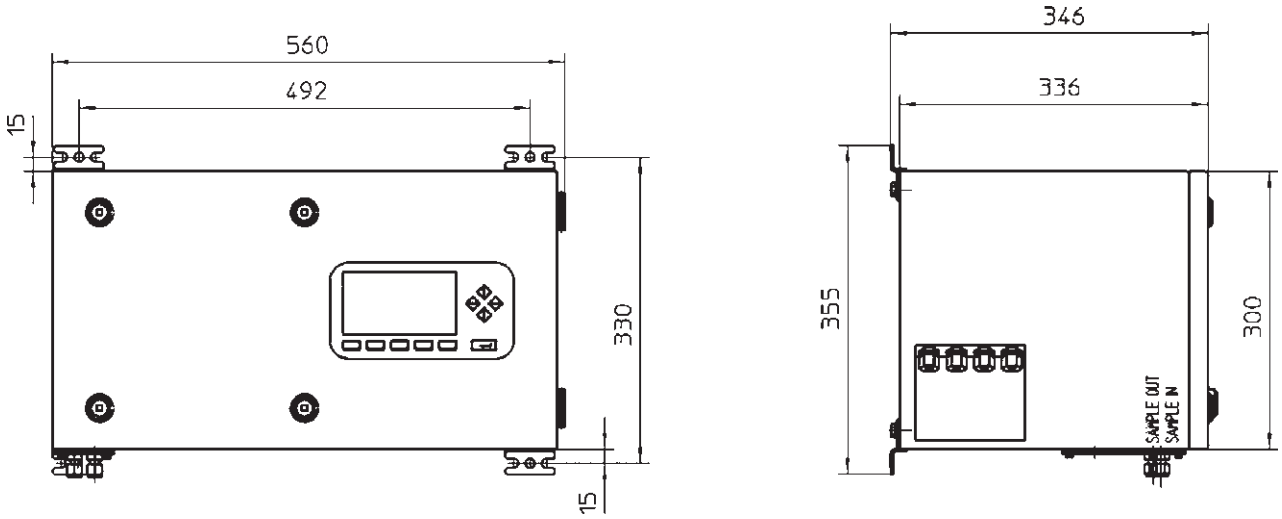
WARNING

EXPLOSION HAZARD !

Do not use the attached EEx p unit or the external valve as a handle for transportation or lifting the instrument! Failure to follow may loosen or damage the devices and impair safety of the whole instrument!

2-3 Dimensional Drawings

2-3-1 Single Enclosure Analyzer



Standard version w/o purging system

Fig. 2-1a
Single enclosure analyzer (approx. dimensions in mm)

2-3-1 Single Enclosure Analyzer

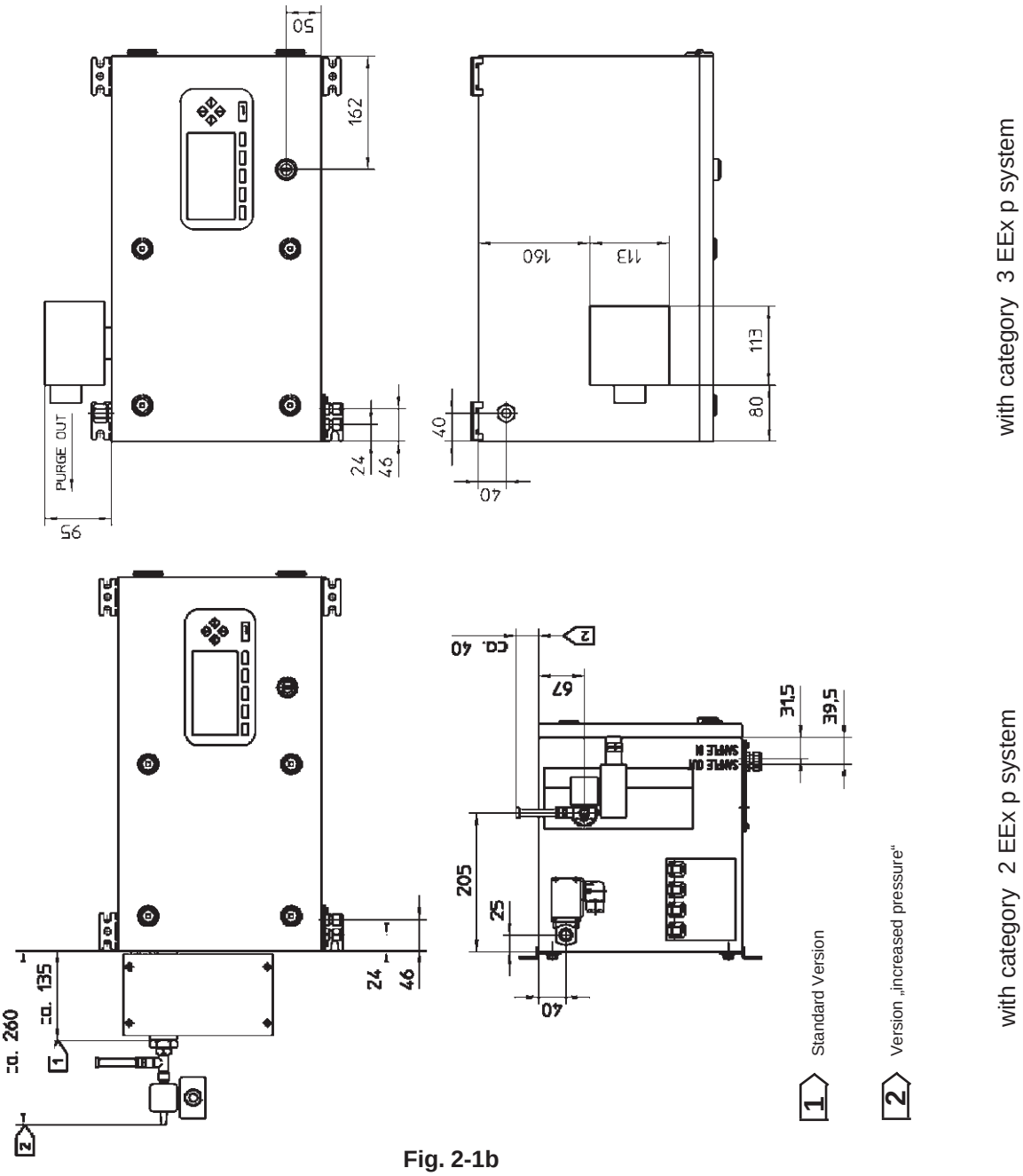
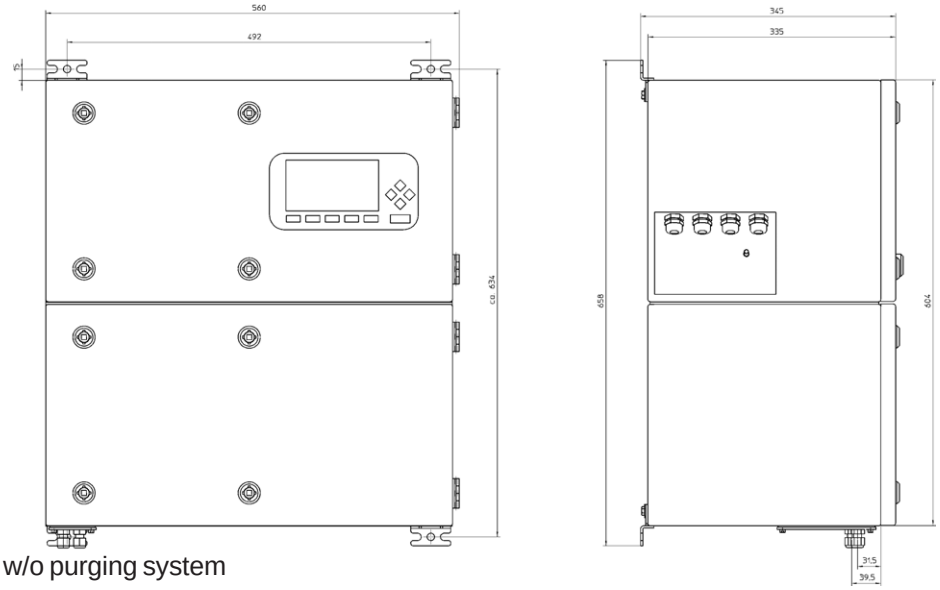
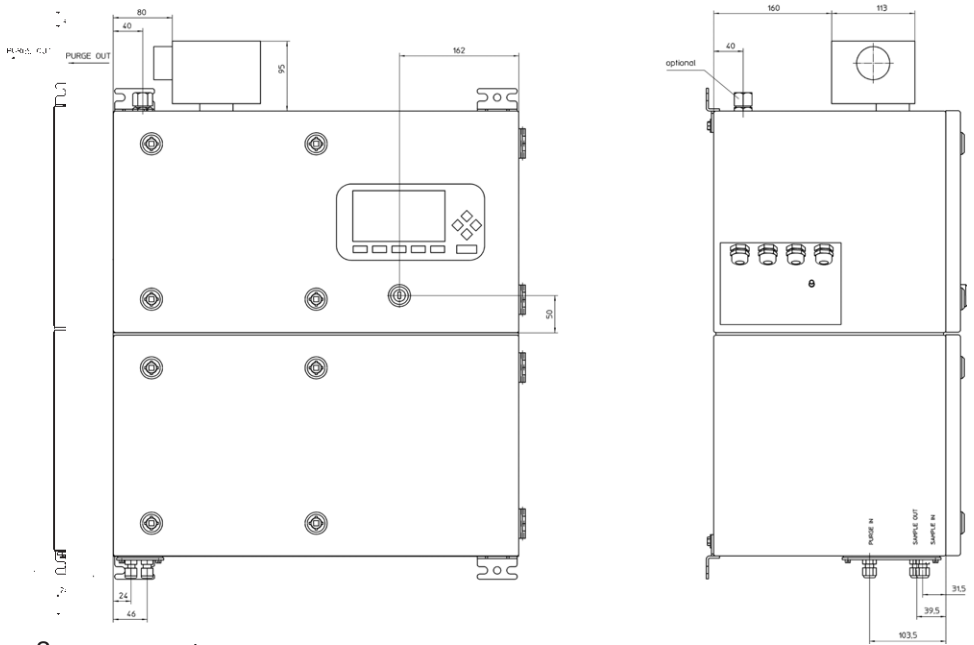


Fig. 2-1b
Single enclosure analyzer (approx. dimensions in mm)

2-3-2 Dual Enclosure Analyzer



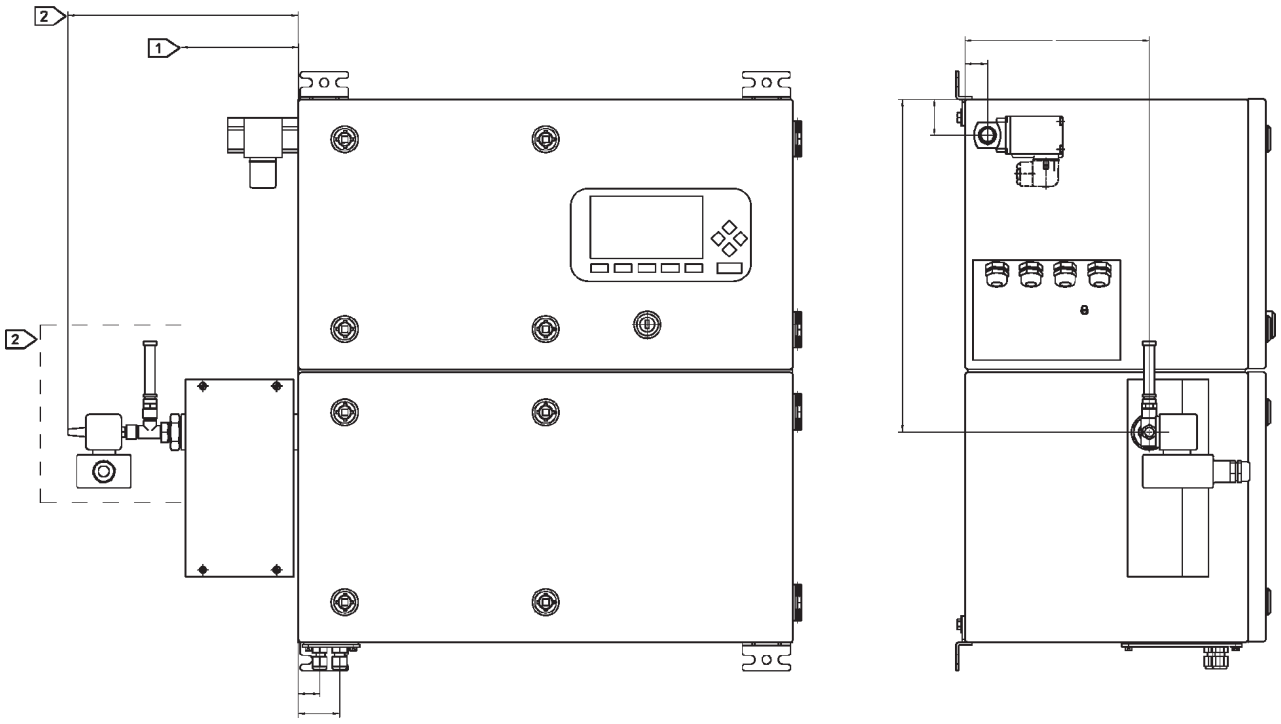
Standard version w/o purging system



with category 3 purging system

Fig. 2-2a
Dual enclosure analyzer (approx. dimensions in mm)

2-3-2 Dual Enclosure Analyzer



1 Standard-Ausführung
Standard Version

2 Ausführung „erhöhter Innendruck“
Version „increased pressure“

with category 2 purging system

Fig. 2-2b
Dual enclosure analyzer (approx. dimensions in mm)

2-4 Connection of Sample Gas and Protective Gas (Purge Gas)

When the analyzer with assembled EEx p safety device has been fixed, connect the gas lines according the diagram (fig. 2-3). The following conditions must be observed for trouble free operation:

- The operator must ensure the minimum pressure of the protective gas at the point of installation.
  A pressure of **2,000 ... 4,000 hPa** (2...4 bar) must be applied to the protective gas inlet of the EEx p safety device.

2-4-1 Hints on Flammable Gases

- When applying flammable gases (either as sample gas or span gas) the corresponding gas inlets and outlets must be equipped with flame arrestors.
- To avoid internal release of flammable gases the minimum pressure specified for the pressurized enclosure is at least 50 Pa higher than the maximum pressure specified for the containment system. A differential pressure switch is provided with the system to operate if the pressure difference falls below 50 Pa.
- The EEx safety device is delivered with fixed basic parameters. The minimum purge gas pressure is preset to 1 mbar for standard applications. Useful modifications such as increasing the max. purge gas pressure must only be done after studying the appropriate sections of the manual of the EEx p safety device.
- Flammable sample gas must not be supplied to the analyzer until the pre-purging phase has ended.
- For Category 2 equipment the switch is connected to the pressurization system to disconnect the complete unit from power in case of a failure (refer to circuit diagrams in the appendix).

The 50 Pa limit is the value defined by the associated standards. It is not allowed to decrease this value but higher values are allowed .

CAUTION

Category 3 equipment:

The purpose(s) for which the differential pressure switch is used (i.e. to disconnect power or to sound an alarm or otherwise maintain the safety of the installation) is the responsibility of the user!

2-4-1 Hints on Flammable Gases

Installing Flame Arrestors

Flame arrestors shipped together with the instrument are to be mounted to the gas fittings plate utilizing the associated steel pipes. Up to 8 flame arrestors may be installed by aligning the as shown in fig. 2-3.

WARNING

Take care of placing and fixing the swivel nuts correctly!

Untightened connections (especially at the analyzer side of the arrestors) may cause malfunction!

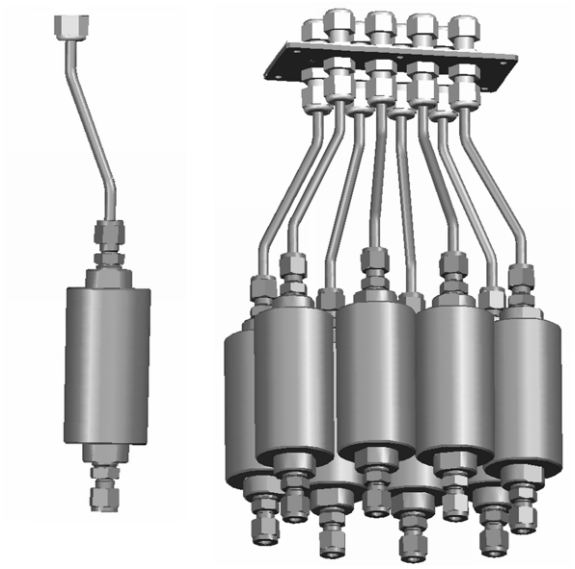


Fig. 2-3
Single and installed flame arrestors

WARNING

Take care of the possible formation of flammable mixtures due to the possibility of air penetration into the containment system and the resulting additional precautions that may be necessary.

CAUTION

Read and take into account the separate flame arrestor documentation, shipped together with the instrument!

2-4-2 MLT 2 Gas Flow Diagrams

2-4-2-1 Gas Flow Diagram for Nonflammable Gases or Flammable Gases diluted below 1/4 LEL

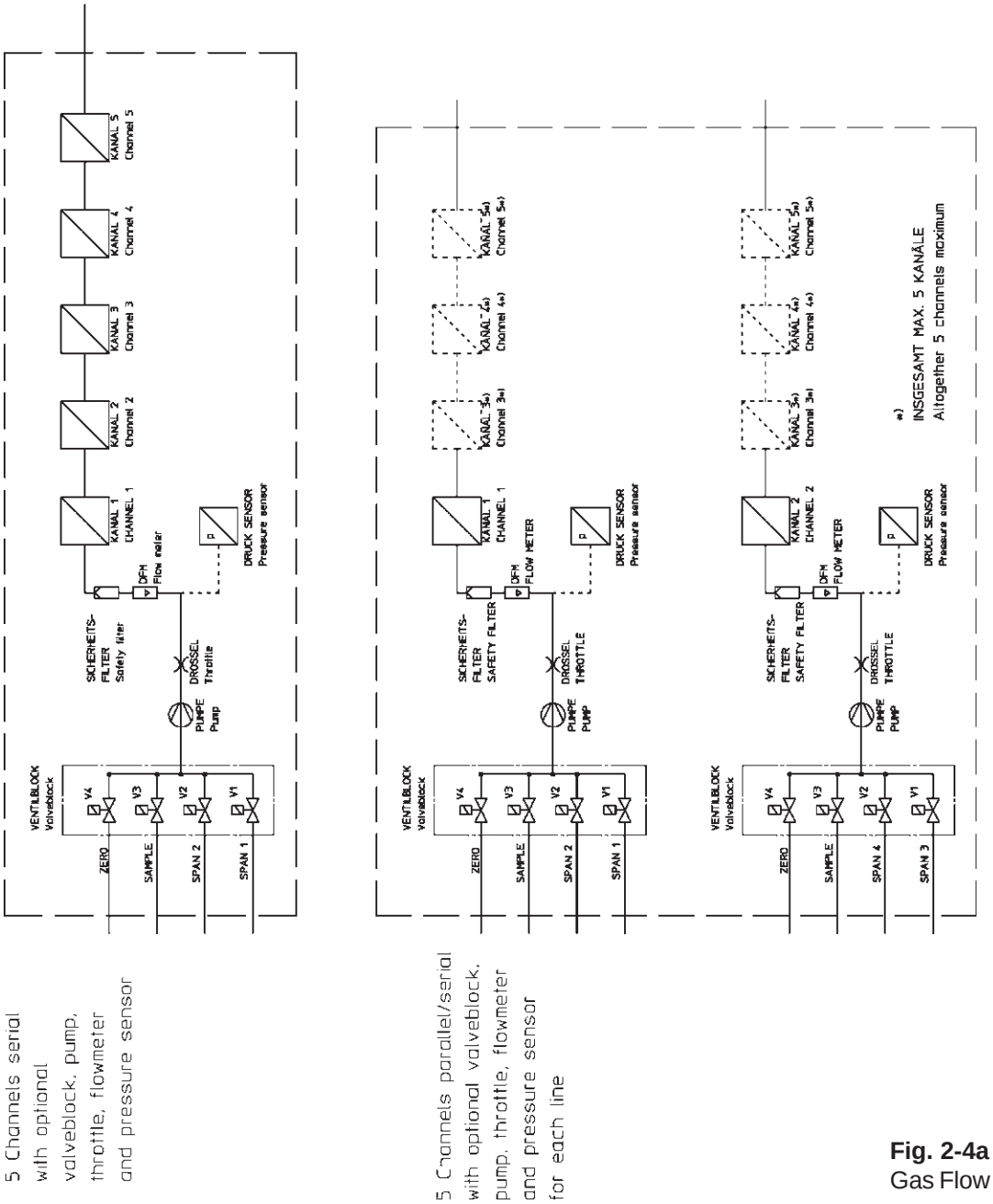


Fig. 2-4a
Gas Flow Diagram

2-4-2 MLT 2 Gas Flow Diagrams

2-4-2-2 Gas Flow Diagrams for Nondiluted Flammable Gases

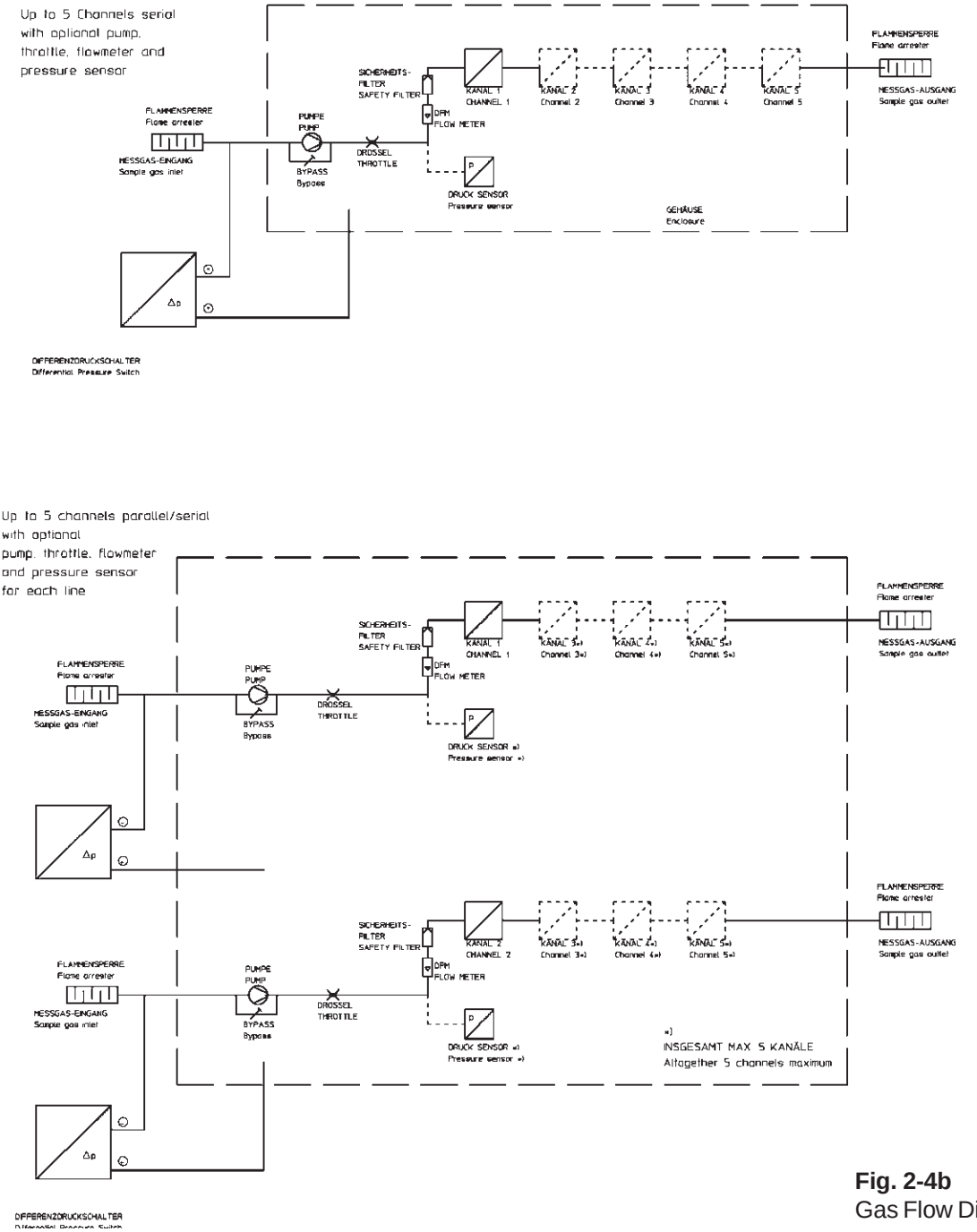


Fig. 2-4b
Gas Flow Diagram

2-4-2-2 Gas Flow Diagrams for Nondiluted Flammable Gases (cont'd)

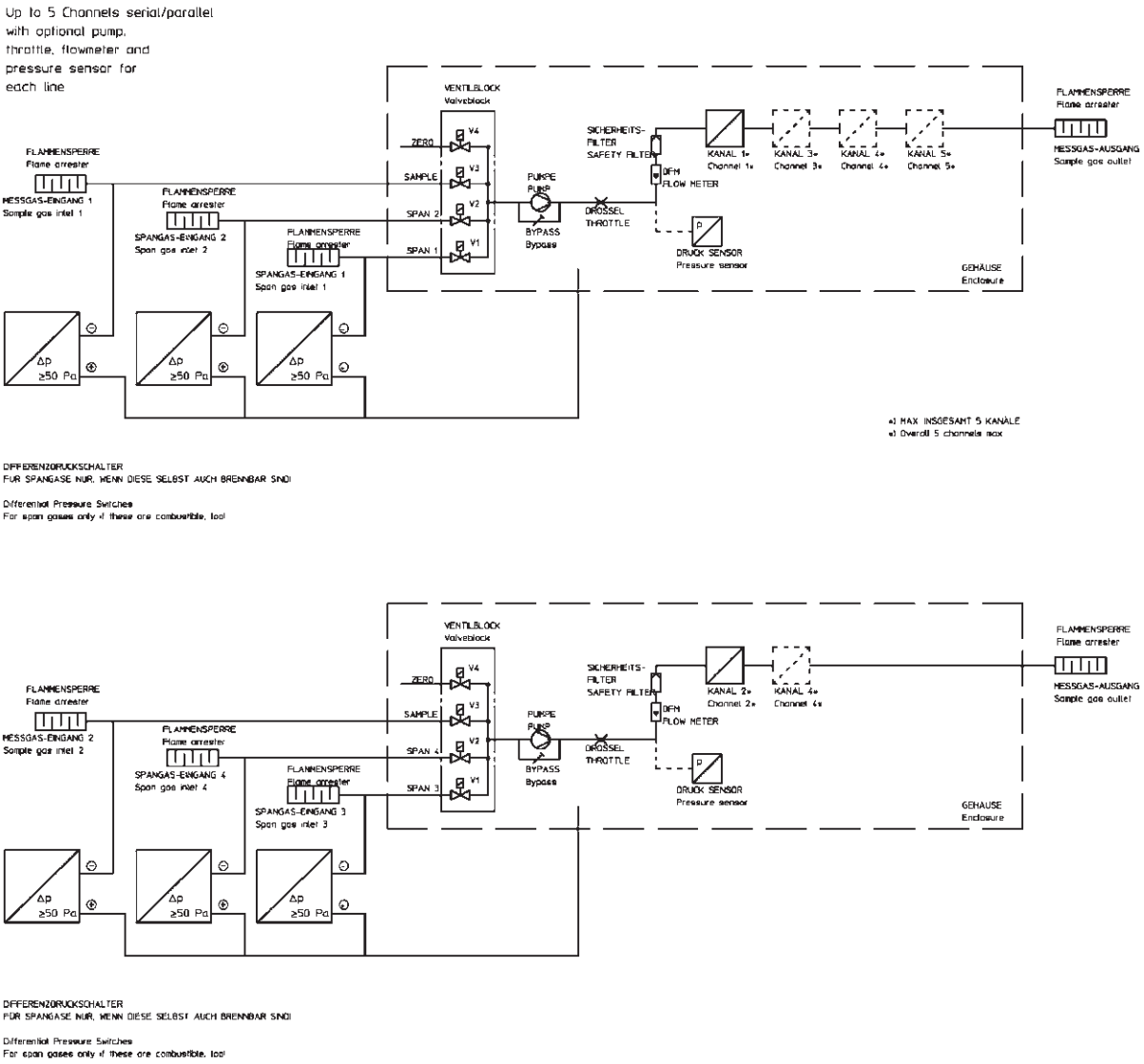
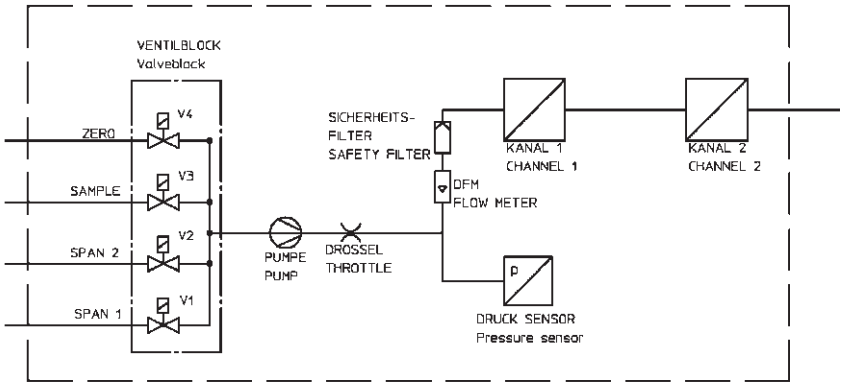


Fig. 2-4c
Gas Flow Diagram

2-4-3 BINOS® 100 F Gas Flow Diagrams

2-4-3-1 Gas Flow Diagram for Nonflammable Gases or Flammable Gases diluted below 1/4 LEL

2 Channels serial with optional valveblock, pump, throttle, flowmeter and pressure sensor



2 Channels parallel with optional valveblock, pump, throttle, flowmeter for each channel and pressure sensor (either for channel 1 or channel 2)

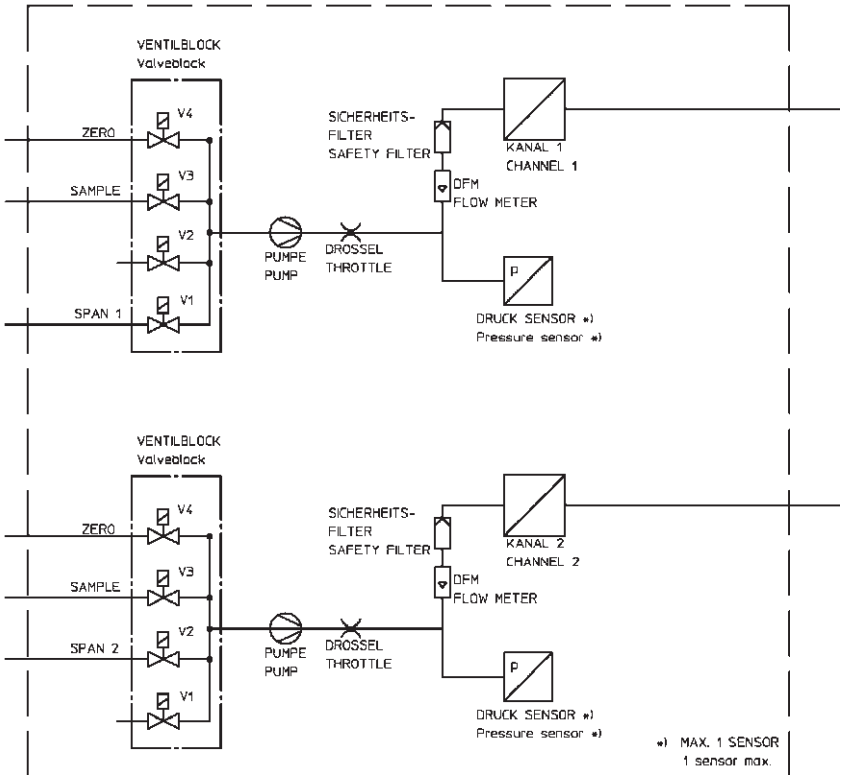


Fig. 2-4d
Gas Flow Diagram

2-4-3-2 Gas Flow Diagrams for Nondiluted Flammable Gases

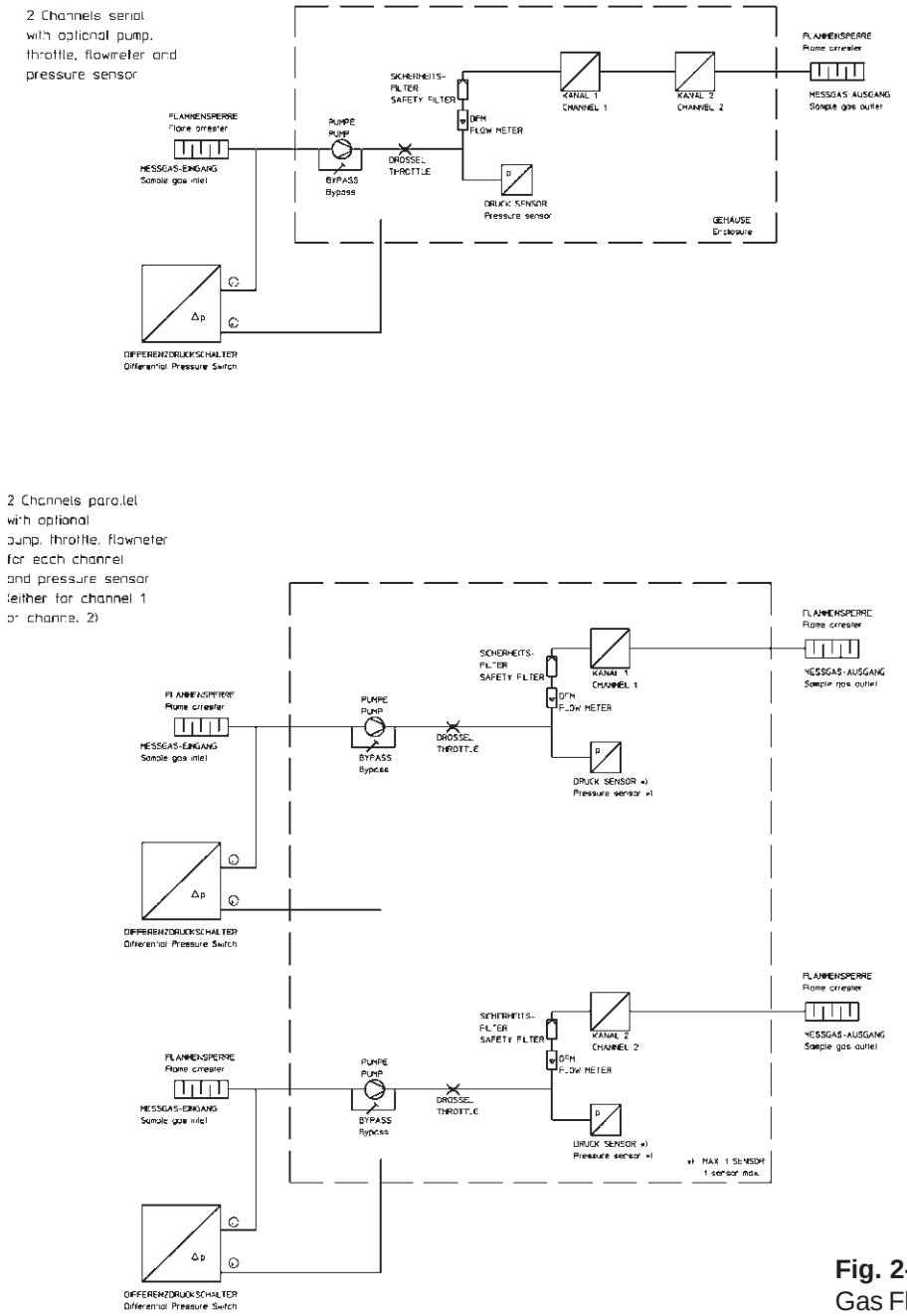


Fig. 2-4e
Gas Flow Diagram

2-4-3 BINOS® 100 F Gas Flow Diagrams

2-4-3-2 Gas Flow Diagrams for Nondiluted Flammable Gases (cont'd)

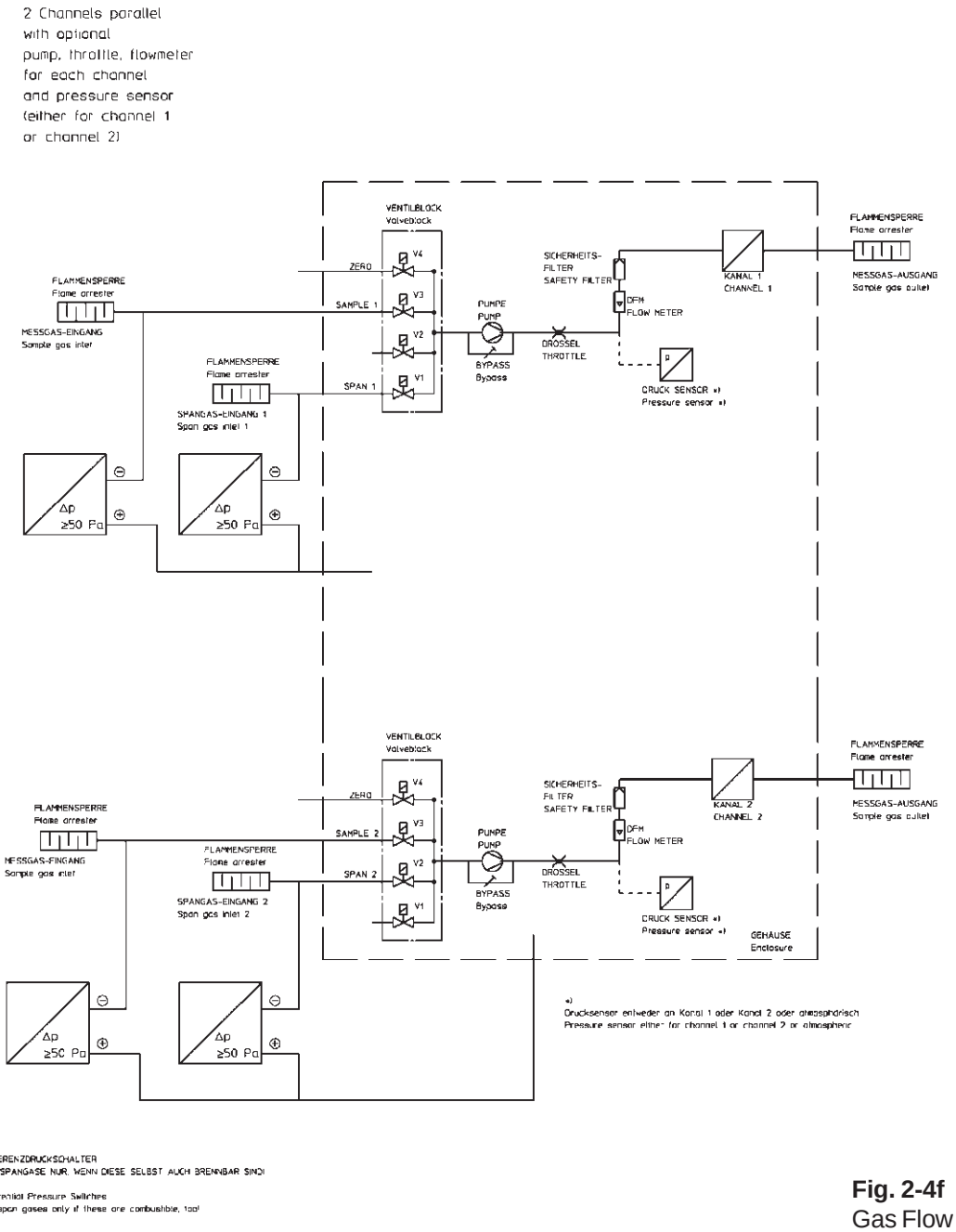


Fig. 2-4f
Gas Flow Diagram

2-4-3 BINOS® 100 F Gas Flow Diagrams

2-4-3-2 Gas Flow Diagrams for Nondiluted Flammable Gases (cont'd)

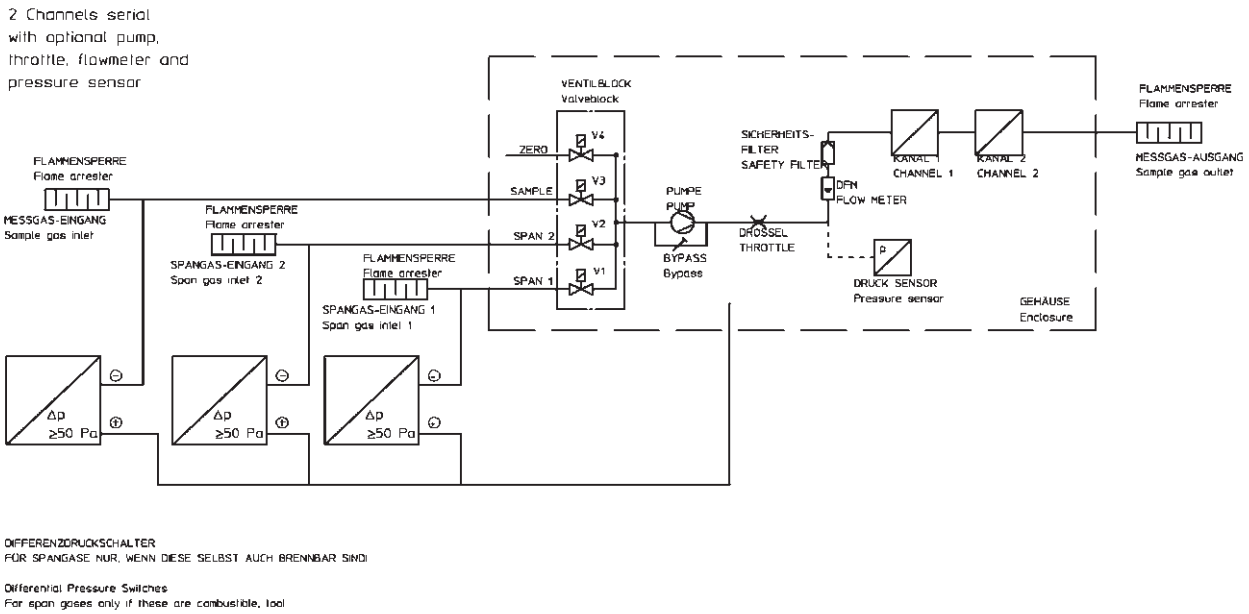


Fig. 2-4g
Gas Flow Diagram

2-5 Safety Device Settings

The EEx safety device is delivered with fixed basic parameters. The purge gas pressure is preset to 1 hPa (rel.; for non-flammable gases). Useful modifications such as increasing the max. purge gas pressure must only be done after studying the appropriate sections of the manual of the EEx p safety device.

As the parameters are selected to be in conformance with the type test results, some of them are not allowed to be changed!
This applies to the pre-purge time, which is adjusted to ensure a 5 times volume exchange within the analyzer enclosure at a preset purge medium flow!

2-6 Special Remarks and Instructions

General

It is not allowed to change the internal purge medium path.

Category 2

Category 2 equipment is provided with a key switch which bypasses the purge system and switches off the automatic monitoring facility. It is therefore also possible to switch on the pressurized system with the housing door open for setting work resp. to keep the analyzer powered even if the front door is opened.

The use of this switch is intended for maintenance purposes only!

This facility should however only be used when it has been ascertained that there is no explosive atmosphere in the vicinity of the unit (fire safety certificate).

When maintenance work has been finished is has to be verified that the switch is turned off!

The purge system M code, preset to 0001, must be replaced by an individual code which must then be entered.

The purge system by-pass code, preset to 0002, must be replaced by an individual code, unequal Zero.

For instructions on how to change the codes see the separate pressurization instruction manual!

2-7 Electrical Connections

WARNING

Installation of and connecting the power supply lines and signal lines is permitted to qualified personnel only!

The standard EN 60079-14 „Electrical Installations in Hazardous Areas“ and all related standards have to be observed.

Failure to follow the proper instructions may cause any one of the following situations to occur: Loss of life; personal injury; property damage; damage to this instrument; and warranty invalidation.

- All connections have to be done according to the schematics delivered together with the equipment.
- A mains switch or ciruit-breaker must be provided at the building installation.
- The equipment enclosure must be connected to an earthing or equipotential bonding conductor.
- All cables introduced into the enclosure must be kept as short as possible.
- The cable glands are designed to fix single cables only, with diameters from 7 to 12 mm. Special inserts are available on request to fix thinner or multiple cables within one gland.
- Mains power terminals are suitable for cables up to 2.5 mm^2 cross section.
- Use only shielded cables for signal lines! To ensure proper electromagnetic compatibility (EMC) it is recommended to follow the installation steps given in section 2-7-1!
- Cables carrying intrinsically safe (EEX i) signals need adequate marking. When running such cables take into consideration the requirements given in the related standards (minimum distance to non-IS cables etc.). If running in minimum distance is not possible clearance may be achieved utilizing solid insulation of suitable thickness.

2-7-1 Cable Gland Assembly Instruction

1. Strip the cable insulation
2. Uncover the shielding

3. Feed cable through gland nut and into fixing element
4. Put the shielding net over the element the way that it covers the o-ring 2 mm.

5. Stick the fixing element into the neck and fix the gland.

2-7-2 Signal Inputs and Outputs

Signal inputs and outputs by default are non-intrinsically safe!
DIN rail installable converters (option) are available to provide intrinsically safe signals (contact your local sales office for detailled information).

WARNING

EXPLOSION HAZARD !

When the analyzer is out of order or if the pressurization unit shuts off all non-intrinsically safe inputs and outputs connected to external equipment MUST be shut off too!

This ensures that no hazardous voltages are present within the analyzer enclosure when not pressurized.

2-7-2 Category 2 Equipment Mains Connection

The mains power line cord has to be connected to the pressurization control unit, terminals 16, 18 and PE (fig. 2-4).

Verify that the mains voltage at the point of installation meets the analyzer nominal voltage!

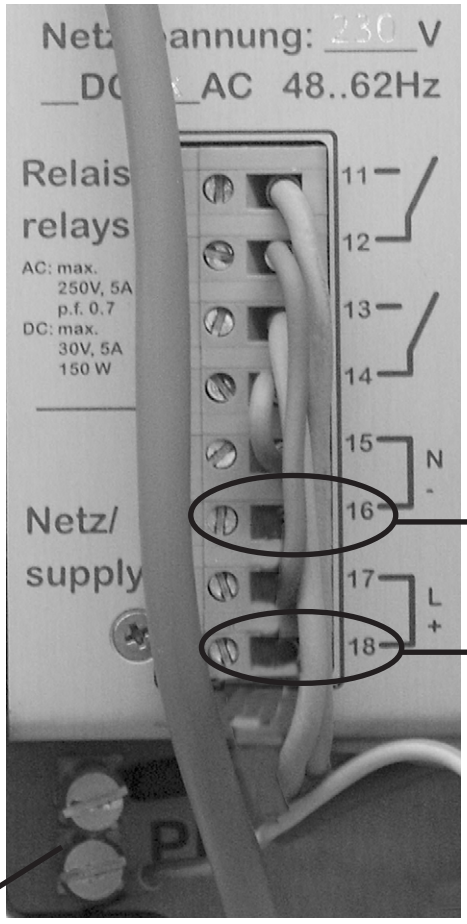


Fig. 2-5
Terminal location inside control unit

2-7-3 Category 3 Equipment Mains Connection

The mains power line cord has to be connected to the terminals provided at the analyzer enclosure's inner left side, near the EMC line filter (fig. 2-5).

Verify that the mains voltage at the point of installation meets the analyzer nominal voltage!

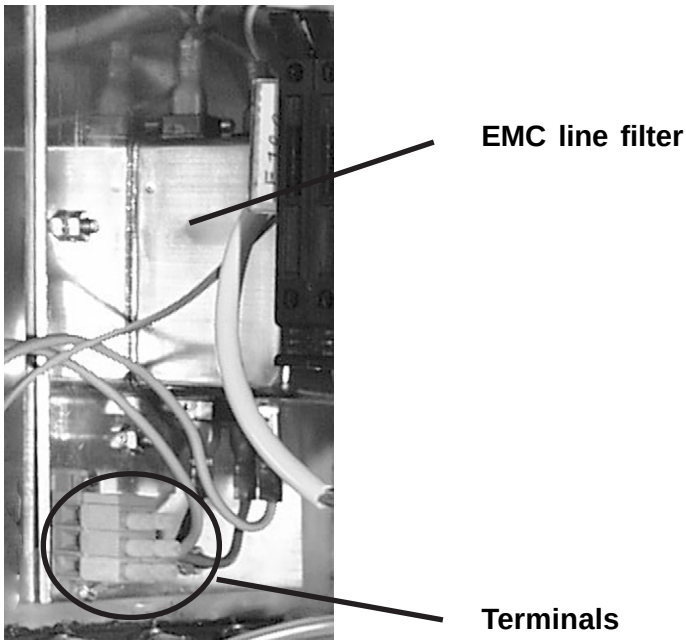


Fig. 2-6
Terminal location inside analyzer

2-7-4 Category 3 Equipment Alarm Contacts

The Category 3 pressure monitor provides alarm contacts activated when the pressure inside the analyzer enclosure is outside the limits.
This alarm loop operates in normally closed connection mode.

The contacts are allowed to be connected to signal circuitry (amplifier, relay) providing output signals according NAMUR/ EN 50227 resp. [EEx ib] IIC only. The standard specifies all essential data and operating conditions.
Consult factory for applicable circuitry which is available from various manufacturers.

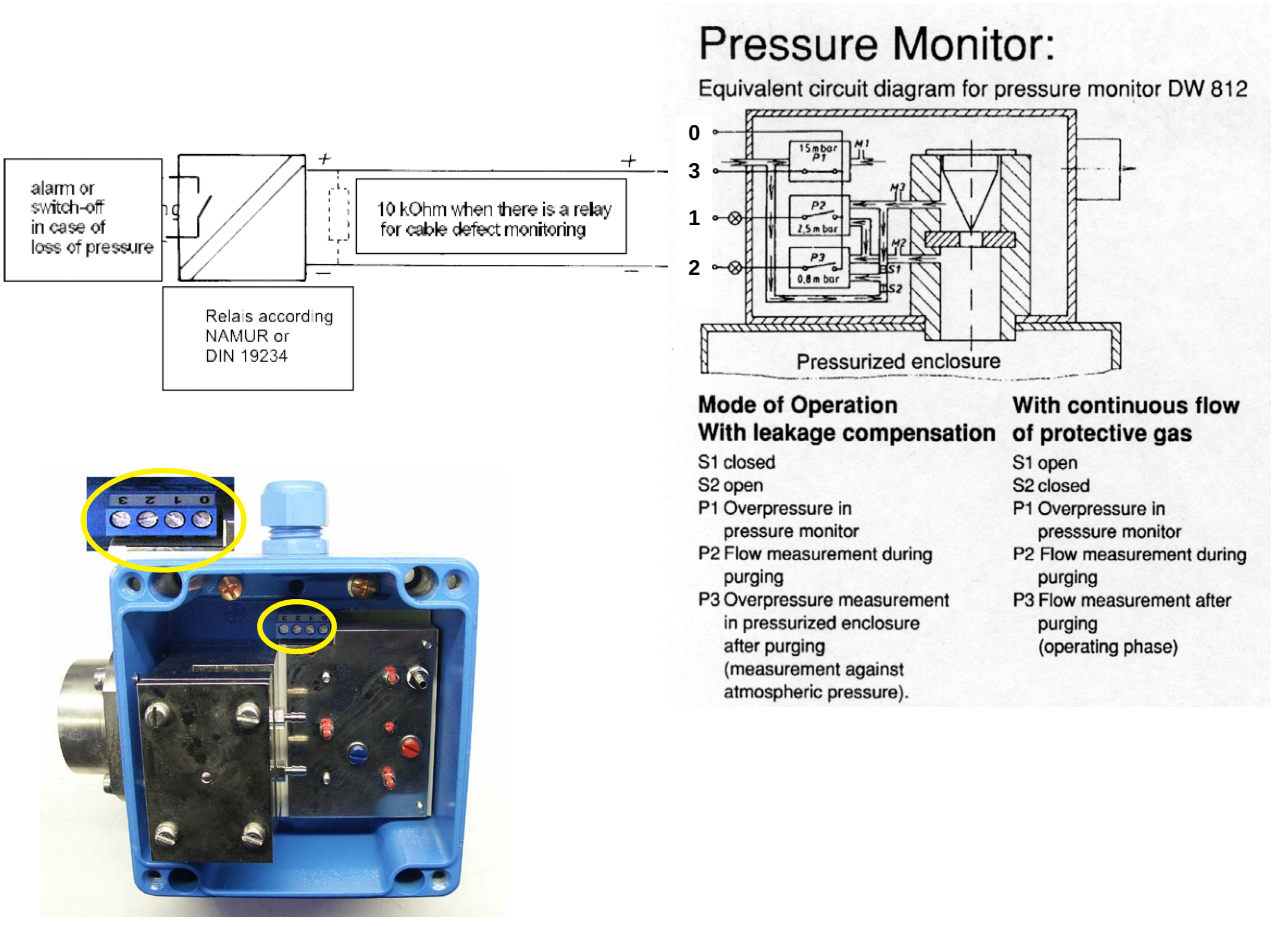


Fig. 2-7
Pressure monitor: Terminal allocationand signal connection

SECTION 3
Startup

WARNING

Startup can only be done properly by personnel being familiar with the contents of all applicable manuals and related instructions!

Especially the warnings provided by the documentation have to be observed!

3-1 Final Check

Make sure that the analyzer and the related pressurization system have been setup as described in section 2 and all covers and doors are closed and fixed.
All unused cable glands need to be sealed using the supplied approved sealing plug (part no. ETC00791; fig. 3-1)
Unused cable gland openings in the enclosure need to be covered using a special screw (part no. ETC 000790; fig. 3-2).

Fig. 3-1
Cable gland sealing plug

WARNING

Use only the components listed above as these are ATEX approved for use in hazardous areas!

Fig. 3-2
Cable gland hexagon socket screw sealing plug

3-2 Switching On

In a next step the analyzer may be powered by opening the purge gas supply and switching on the power supply.

SECTION 4
Maintenance

WARNING

After maintenance or replacement of parts concerning explosion protection an authority on explosion protection has to verify that the analyzer still meets the requirements for explosion protection before it is switched on again.

If parts essential for explosion protection are repaired they have to be routine tested!

The authority has to issue a certificate for this and/or attach a test label to the equipment before startup after maintenance or replacement of parts.

4-1 Maintenance Interval

To ensure the performance and safety of the equipment it has to be checked on a regular basis, at least once a year. Special care has to be taken for the EEx p saftey device and parts ensuring explosion protection (e.g. gaskets).

It is the operators/owners responsibility to extend the maintenance interval with respect to negative influences of gases or environment on materials in contact with the sample gas or ensuring explosion protection (e.g. gaskets).

4-2 Gasanalyzer

Refer to the associated manual for detailed information on maintenance, replacement of parts and how to carry out a containment system leak test.

Defective parts relevant for the explosion protection must only be replaced by original Emerson Process Management spare parts!

Unauthorized parts and procedures can affect the product's performance, place the safe operation of your process at risk and affect the explosion protection!

4-3 Pressurization Systems and Other Additional Equipment

Refer to the associated manuals for detailed information on maintenance and replacement of parts.

4-4 Verifications and Tests on Modified or Repaired Electrical Apparatus

Modifications made on the electrical apparatus affecting the integrity of the type of protection or the temperature of the apparatus shall be permitted only if the modified apparatus is resubmitted to a testing station.

In the case of repairs of electrical apparatus affecting the type of protection, the parts which have been repaired should be subjected to new routine verifications and tests. These test s need not necessarily be made by the manufacturer.

4-4-1 System with 14 mbar Operating Pressure

4-4-1-1 Preparations

Required tools:

- Manometer with full scale between 50 and 100 mbar and resolution of 0.1 mbar.
- Flow meter with full scale between 5 and 10 l/min, resolution 0.1 l/min.
- Test gas: Compressd air or Nitrogen, pressure reduced to max. 1,500 hPa.
- Pressure regulator to reduce the pressure to values of 25 resp. 37.5 mbar.
- Equipment for flow regulation
- 1 plug to seal the purge gas outlet (size 1“)
- 1 plug to seal gas outlet (size 6 mm)

To carry out the routine tests the following steps have to be performed:

- Disconnect the analyzer and the pressurization unit from power.
- Seal the purge medium outlet at the pressurization unit (1“ opening at the left side).
- Disconnect the containment system gas connectors from the external gas lines.
- Disconnect one of the containment system gas connectors inside the analyzer and seal the other one.
  (Remark: Now it must be possible set the enclosure under pressure by applying an external gas (e.g. compressed air) to the gas connector.)
- Connect an external source of compressed air as described in the drawing on the next page (fig. 4-1).

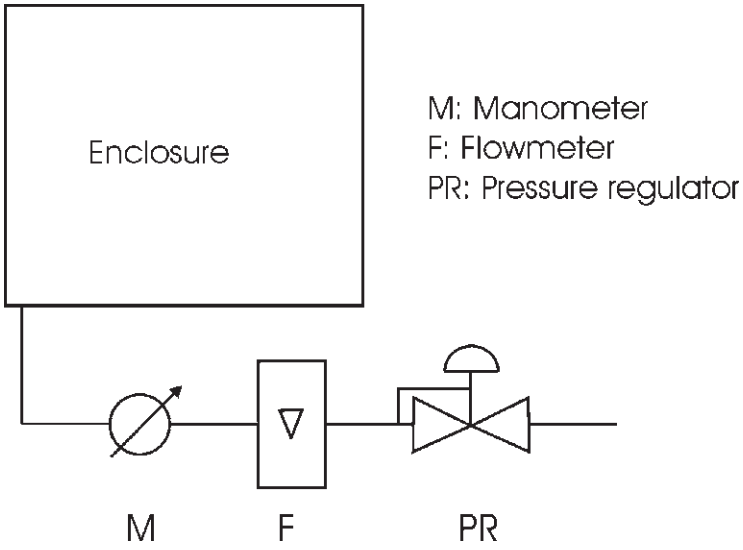


Fig. 4-1
Setup for routine tests

4-4-1-2 Overpressure Test

A pressure of 37.5 mbar (= 1.5 times the maximum overpressure specified) has to be applied to the pressurized enclosure. To do this the following has to be performed:

- Carefully apply a pressure of 37.5 mbar to the enclosure and hold this pressure for a period of 2 minutes +/- 10 seconds.

The test is considered to be satisfactory if no permanent deformation occures which would invalidate the type of protection.
Keep the modifications to carry out the leakage test (sec. 4-4-1-3).

4-4-1-3 Leakage Test

The leakage of the enclosure has to be measured with an overpressure of 25 mbar applied to the pressurized enclosure. To do this the following steps have to be performed:

- Make sure the modifications as described in the section 4-4-1-1are still existent.
- Apply an overpressure of 25 mbar to the analyzer enclosure and take the reading of the flow meter.

The test is considered to be satisfacotry if the measured value is acceptable compared to the following values.
Acceptable flow values are:

- single analyzer: 3 l/minute maximum
- dual analyzer: 4.5 l/minute maximum

4-4-2 System with 90 mbar Operating Pressure

4-4-2-1 Preparations

Required tools:

- Manometer with full scale between 150 and 200 mbar and resolution of 0.1 mbar.
- Flow meter with full scale between 5 and 10 l/min, resolution 0.1 l/min.
- Test gas: Compressd air or Nitrogen, pressure reduced to max. 1,500 hPa.
- Pressure regulator to reduce the pressure to values of 95 resp. 143 mbar.
- Equipment for flow regulation
- 1 plug to seal the purge gas outlet (size 1“)
- 1 plug to seal gas outlet (size 6 mm)

To carry out the routine tests the following steps have to be performed:

- Disconnect the analyzer and the pressurization unit from power.
- Seal the purge medium outlet at the pressurization unit (1“ opening at the left side).
- Disconnect the containment system gas connectors from the external gas lines.
- Disconnect one of the containment system gas connectors inside the analyzer and seal the other one.
  (Remark: Now it must be possible set the enclosure under pressure by applying an external gas (e.g. compressed air) to the gas connector.)
- Connect an external source of compressed air as described in the drawing on the next page (fig. 4-2).

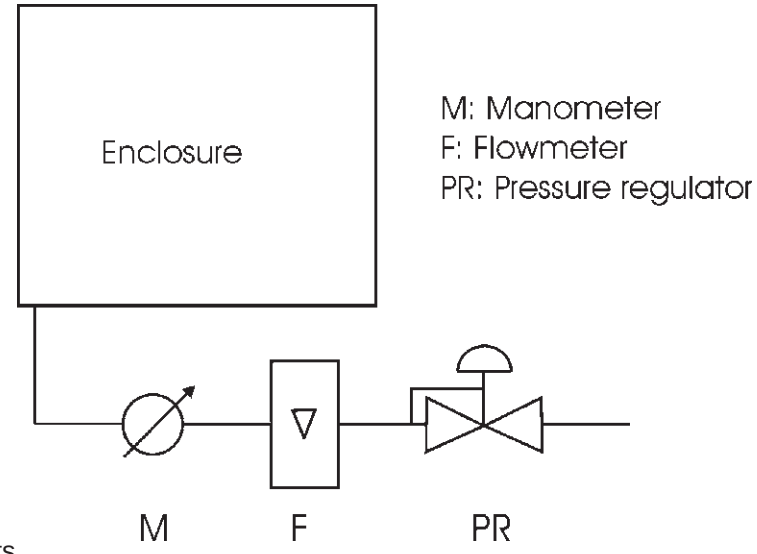


Fig. 4-2
Setup for routine tests

4-4-2-2 Overpressure Test

A pressure of 143 mbar (= 1.5 times the maximum overpressure specified) has to be applied to the pressurized enclosure. To do this the following has to be performed:

- Carefully apply a pressure of 37.5 mbar to the enclosure and hold this pressure for a period of 2 minutes +/- 10 seconds.

The test is considered to be satisfactory if no permanent deformation occures which would invalidate the type of protection.
Keep the modifications to carry out the leakage test (sec. 4-4-2-3).

4-4-2-3 Leakage Test

The leakage of the enclosure has to be measured with an overpressure of 95 mbar applied to the pressurized enclosure. To do this the following steps have to be performed:

- Make sure the modifications as described in the section 4-4-2-1are still existent.
- Apply an overpressure of 95 mbar to the analyzer enclosure and take the reading of the flow meter.

The test is considered to be satisfacotry if the measured value is acceptable compared to the following values.
Acceptable flow values are:

- single analyzer: 3 l/minute maximum
- dual analyzer: 4.5 l/minute maximum

4-4-3 Removal of Modifications

Remove all the modifications described in section 4-4-1 resp. 4-4-2. Take special care of the gas connections to be tightend.

APPENDIX

A-1 EC Declarations of Conformity

EC DECLARATION OF CONFORMITY

Document number: RAE/MLT 2 -ATEX-E3
Date: 2003, September

We,

Emerson Process Management
Manufacturing GmbH & Co. OHG

located at

Industriestraße 1, D-63594 Hasselroth, Germany

declare under our sole responsibility that our gas analyzer, type

MLT 2 with pressurized enclosure

to which this declaration relates is in accordance with the provisions of:

89/336/EEC	**EMC Directive (changed by directive 91/263/EEC 92/31/EEC and 93/68/EEC)** with the application of the harmonized standards: **EN 61326-1:1997 + A1:1998 + A2:2001 + A3:2003**
94/9/EG	**Equipment and protective systems in potentially explosive atmospheres** with the application of the harmonized standards: **EN 50014:1997 + A1 + A2, EN 50016:1995, EN 50020:1994** An EC Type Examination Certificate has been issued: LCIE 03 ATEX 6010 X. Notified body for QA assessment: TÜV Rheinland Berlin Brandenburg no. 0035
97/23/EC	**Pressure Equipment Directive** This analyzer has been designed and manufactured considering Sound Engineering Practice and article 3, paragraph 3 of the above mentioned directive and therefore CE marking does not refer to this directive.

The standards published in the EC's OFFICIAL JOURNAL with reference to directive 73/23/EC (e.g. EN 61010) have been used to fulfill 1.2.7 of Annex II of directive 94/9/EC to eliminate electrical risks.

This declaration relates to series MLT 2 analyzers with pressurized enclosure intended to be used at hazardous locations of Zone 1. MLT 2 does include any field housing (single or dual compartment) based on NGA analyzers. An EC Type Examination Certificate, LCIE 03 ATEX 6010 X, has been obtained from a notified body.

Hasselroth, 6/30/2004

.....
(Signature)

Ian Macleod
(Name)

VP Sales & Marketing EMA
(Function name)

This declaration confirms the compliance with announced directives but does not include the assurance of properties.
The safety and installation instructions of the documentation have to be followed.

A-1 EC Declarations of Conformity

EC DECLARATION OF CONFORMITY

Document number: RAE/BINOS 100 F -ATEX-E3
Date: 2003, September

We,

Emerson Process Management
Manufacturing GmbH & Co. OHG

located at

Industriestraße 1, D-63594 Hasselroth, Germany

declare under our sole responsibility that our gas analyzer, type

BINOS 100 F with pressurized enclosure

to which this declaration relates is in accordance with the provisions of:

89/336/EEC	**EMC Directive (changed by directive 91/263/EEC 92/31/EEC and 93/68/EEC)** with the application of the harmonized standards: **EN 61326-1:1997 + A1:1998 + A2:2001 + A3:2003**
94/9/EG	**Equipment and protective systems in potentially explosive atmospheres** with the application of the harmonized standards: **EN 50014:1997 + A1 + A2, EN 50016:1995, EN 50020:1994** An EC Type Examination Certificate has been issued: LCIE 03 ATEX 6010 X. Notified body for QA assessment: TÜV Rheinland Berlin Brandenburg no. 0035
97/23/EC	**Pressure Equipment Directive** This analyzer has been designed and manufactured considering Sound Engineering Practice and article 3, paragraph 3 of the above mentioned directive and therefore CE marking does not refer to this directive.

The standards published in the EC's OFFICIAL JOURNAL with reference to directive 73/23/EC (e.g. EN 61010) have been used to fulfill 1.2.7 of Annex II of directive 94/9/EC to eliminate electrical risks.

This declaration relates to series BINOS 100 F analyzers with pressurized enclosure intended to be used at hazardous locations of Zone 1. BINOS 100 F does include any field housing based on BINOS 100(M), Hydros 100 or OXYNOS 100 analyzers. An EC Type Examination Certificate, LCIE 03 ATEX 6010 X, has been obtained from a notified body.

Hasselroth, 6/30/2004

.....
(Signature)

Ian Macleod
(Name)

VP Sales & Marketing EMA
(Function name)

This declaration confirms the compliance with announced directives but does not include the assurance of properties.
The safety and installation instructions of the documentation have to be followed.

A-1 EC Declarations of Conformity

EC DECLARATION OF CONFORMITY

Document number: RAE/MLT 2-ATEX-E1 non flammable Gases
Date: 2004, June

We,

Emerson Process Management
Manufacturing GmbH & Co. OHG

located at

Industriestraße 1, D-63594 Hasselroth, Germany

declare under our sole responsibility that our gas analyzer, type

MLT 2 with pressurized enclosure

to which this declaration relates is in accordance with the provisions of:

89/336/EEC	**EMC Directive** (changed by directive 91/263/EEC 92/31/EEC and 93/68/EEC) with the application of the harmonized standards: **EN 61326-1:1997 + A1:1998 + A2:2001 + A3:2003**
94/9/EG	**Equipment and protective systems in potentially explosive atmospheres** with the application of the harmonized standards: **EN 50014:1997 + A1 + A2, EN 50016:1995, EN 50020:1994** An EC Type Examination Certificate has been issued: LCIE 03 ATEX 6011 X. Notified body for QA assessment: TÜV Rheinland Berlin Brandenburg no. 0035
97/23/EC	**Pressure Equipment Directive** This analyzer has been designed and manufactured considering Sound Engineering Practice and article 3, paragraph 3 of the above mentioned directive and therefore CE marking does not refer to this directive.

The standards published in the EC's OFFICIAL JOURNAL with reference to directive 73/23/EC (e.g. EN 61010) have been used to fulfill 1.2.7 of Annex II of directive 94/9/EC to eliminate electrical risks.

This declaration relates to series MLT 2 analyzers with pressurized enclosure intended to be used at hazardous locations of Zone 2 to measure non flammable gases. MLT 2 does include any field housing (single or dual compartment) based on NGA analyzers.
An EC Type Examination Certificate, LCIE 03 ATEX 6011 X, has been obtained from a notified body.

Hasselroth, 6/30/2004 .....

(Signature)

Ian Macleod
(Name)

VP Sales & Marketing EMA
(Function name)

This declaration confirms the compliance with announced directives but does not include the assurance of properties.
The safety and installation instructions of the documentation have to be followed.

A-1 EC Declarations of Conformity

EC DECLARATION OF CONFORMITY

Document number: RAE/BINOS 100 F-ATEX-E1 non flammable Gases
Date: 2004, June

We,

Emerson Process Management
Manufacturing GmbH & Co. OHG

located at

Industriestraße 1, D-63594 Hasselroth, Germany

declare under our sole responsibility that our gas analyzer, type

BINOS 100 F with pressurized enclosure

to which this declaration relates is in accordance with the provisions of:

89/336/EEC	**EMC Directive (changed by directive 91/263/EEC 92/31/EEC and 93/68/EEC)** with the application of the harmonized standards: **EN 61326-1:1997 + A1:1998 + A2:2001 + A3:2003**
94/9/EG	**Equipment and protective systems in potentially explosive atmospheres** with the application of the harmonized standards: **EN 50014:1997 + A1 + A2, EN 50016:1995, EN 50020:1994** An EC Type Examination Certificate has been issued: LCIE 03 ATEX 6011 X. Notified body for QA assessment: TÜV Rheinland Berlin Brandenburg no. 0035
97/23/EC	**Pressure Equipment Directive** This analyzer has been designed and manufactured considering Sound Engineering Practice and article 3, paragraph 3 of the above mentioned directive and therefore CE marking does not refer to this directive.

The standards published in the EC's OFFICIAL JOURNAL with reference to directive 73/23/EC (e.g. EN 61010) have been used to fulfill 1.2.7 of Annex II of directive 94/9/EC to eliminate electrical risks.

This declaration relates to series BINOS 100 F analyzers with pressurized enclosure intended to be used at hazardous locations of Zone 2 to measure non flammable gases. BINOS 100 F does include any field housing based on BINOS 100(M), Hydros 100 or OXYNOS 100 analyzers.
An EC Type Examination Certificate, LCIE 03 ATEX 6011 X, has been obtained from a notified body.

Hasselroth, 6/30/2004

.....
(Signature)

Ian Macleod
(Name)

VP Sales & Marketing EMA
(Function name)

This declaration confirms the compliance with announced directives but does not include the assurance of properties.
The safety and installation instructions of the documentation have to be followed.

A-2 EC Type Examination Certificates

A-2-1 Category 2 Certificate

L C I E

1 **ATTESTATION D'EXAMEN CE DE TYPE**

2 Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles
Directive 94/9/CE

3 Numéro de l'attestation CE de type
LCIE 03 ATEX 6010 X

4 Appareil ou système de protection :
Analyseur de gaz
Type : BINOS 100 F & MLT 2

5 Demandeur : Fisher-Rosemount MFG Gmbh & Co. OHG

6 Adresse : Industriestrasse 1
63594 Hasselroth - Germany

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées est décrit dans l'annexe de la présente attestation et dans les documents descriptifs cités en annexe.

8 Le LCIE, organisme notifié sous la référence 0081 conformément a l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles en ce qui concerne la sécurité et la santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive. Les vérifications et épreuves figurent dans notre rapport confidentiel N° 39435010.

9 Le respect des exigences essentielles en ce qui concerne la sécurité et la santé est assuré par la conformité aux documents suivants :
- EN 50014 (1997) + amendements 1 et 2
- EN 50016 (1995)
- EN 50020 (1994)

10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que ce matériel ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 Cette attestation d'examen CE de type concerne uniquement la conception et le construction de l'appareil ou du système de protection spécifié, conformément à la directive 94/9/CE. Des exigences supplémentaires de cette directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection.

12 Le marquage de l'appareil ou du système de protection devra comporter, entre autres indications utiles, les mentions suivantes :
Ex II 2 G
EEx p ia [ia] IIC T4
Fontenay-aux-Roses, le 6 février 2003

1 **EC TYPE EXAMINATION CERTIFICATE**

2 Equipment or protective system intended for use in potentially explosive atmospheres
Directive 94/9/CE

3 EC type Examination Certificate number
LCIE 03 ATEX 6010 X

4 Equipment or protective system :
Gas analyser
Type : BINOS 100 F & MLT 2

5 Applicant : Fisher-Rosemount MFG Gmbh & Co. OHG

6 Address : Industriestrasse 1
63594 Hasselroth - Germany

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 LCIE, notified body number 0081 in accordance with article 9 of the Directive 94/9/CE of the European Parliament and Council of 23 March 1994. certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmospheres, given in Annex II to of the Directive.
The examination and test results are recorded in confidential report No 39435010.

9 Compliance with the Essential Health and Safety Requirements been assured by compliance with :
- EN 50014 (1997) + amendments 1 et 2
- EN 50016 (1995)
- EN 50020 (1994)

10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC Type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of the Directive applies to the manufacture and supply of this equipment or protective system.

12 The marking of the equipment or protective system shall include the following :
Ex II 2 G
EEx p ia [ia] IIC T4
Le Directeur de l'organisme certificateur
Manager of the certification body

Par délégation
Michel BRÉNON
Directeur adjoint
à la Certification

Timbre sec / Dry seal

Page 1/3

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LCIE
Laboratoire Central
des Industries Electriques
Une société de Bureau Veritas

A-2-1 Category 2 Certificate

(A1) **ANNEXE**

(A2) **ATTESTATION D'EXAMEN CE DE TYPE**

LCIE 03 ATEX 6010 X

(A3) Description de l'équipement ou du système de protection :

L'analyseur de gaz BINOS 100 F combine un module de mesure par infrarouge (NDIR), par thermo-conductivité (TC) et/ou par capteur d'oxygène paramagnétique (PO2) ou électrochimique (EO2). L'ensemble de mesure se compose de un ou deux canaux et est contenu dans une enveloppe pressurisée.

L'analyseur de gaz MLT 2 à enveloppe simple ou double combine jusqu'à cinq canaux de mesure utilisant l'infrarouge (NDIR), l'ultraviolet (UV), un capteur d'oxygène paramagnétique (PO2) ou électrochimique (EO2) et un module de thermo-conductivité (TC). Les différents modules de mesure sont installés dans un enveloppe pressurisée.

Les deux analyseurs type BINOS 100 F ou MLT 2 peuvent être utilisés en zone 1 avec une module de pressurisation certifié zone 1.

Les paramètres électriques sont les suivants :

Tension d'alimentation : 120 / 230 VAC, 50 / 60Hz
Puissance maximale dissipée: 1000 VA

Le marquage est le suivant :

Fisher-Rosemount MFG Gmbh & Co. OHG
Adresse
Type : ...
Numéro de fabrication
Année de construction
03 ATEX 6010 X
⟨Ex⟩ II 2G
EEx p ia [ia] IIC T4

Pour les modèles BINOS 100 F & MLT 2 (Enveloppe simple) :
Volume interne libre : 56,1 L
Débit minimum de balayage : 8 Nm^3/h
Temps de balayage : 5 min.
Surpression minimale de l'enveloppe : 1 mbar
Débit de fuite maximale : 22 Nm^3/h
Surpression maximale : 25 mbar

Pour le modèle MLT 2 (Enveloppe double) :
Volume interne libre : 112 L
Débit minimum de balayage : 7 Nm^3/h
Temps de balayage : 17 min.
Surpression minimale de l'enveloppe : 1 mbar
Débit de fuite maximale : 22 Nm^3/h
Surpression maximale : 25 mbar

NE PAS OUVRIR EN PRESENCE D'ATMOSPHERE EXPLOSIBLE.

Les symboles "ia", "[ia]" du marquage général devront être indiqués ou supprimés en fonction des composants intégrés dans l'enveloppe "p".

(A1) **SCHEDULE**

(A2) **EC TYPE EXAMINATION CERTIFICATE**

LCIE 03 ATEX 6010 X

(A3) Description of Equipment or Protective System:

The gas analyser BINOS 100 F combines infrared (NDIR) measurement, thermal conductivity (TC) measurement and/or paramagnetic (PO2) or electrochemical (EO2) oxygen sensors as single or dual channel instrument in a pressurized housing.

The single or dual enclosure gas analyser MLT 2 combines up to five measuring channels using infrared (NDIR), ultraviolet (UV), paramagnetic (PO2) or electrochemical (EO2) oxygen sensors and thermal conductivity (TC) measurement principles in a pressurized housing.

Both analysers type BINOS 100 F or MLT 2 may be used in zone 1 with a zone 1 purge system.

The electrical parameters are the following :

Supply voltage : 120 / 230 VAC, 50 / 60 Hz
Maximal dissipated power : 1000 VA

The marking is the following :

Fisher-Rosemount MFG Gmbh & Co. OHG
Address
Type : ...
Serial number
Year of construction
03 ATEX 6010 X
⟨Ex⟩ II 2G
EEx p ia [ia] IIC T4

For types BINOS 100 F & MLT 2 (Single enclosure) :
Internal free volume : 56,1 L
Minimum purging flow rate : 8 Nm^3/h
Minimum purging duration : 5 min.
Minimum overpressure of the enclosure : 1 mbar
Maximum leakage flow rate : 22 Nm^3/h
Maximum overpressure : 25 mbar

For type MLT 2 (Dual enclosure) :
Internal free volume : 112 L
Minimum purging flow rate : 7 Nm^3/h
Minimum purging duration : 17 min.
Minimum overpressure of the enclosure : 1 mbar
Maximum leakage flow rate : 22 Nm^3/h
Maximum overpressure : 25 mbar

DO NOT OPEN IN PRESENCE OF HAZARDOUS ATMOSPHERE.

The acronyms "ia", "[ia]" of the general marking must be indicated or removed according to the integrated components inside the enclosure "p".

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A-2-1 Category 2 Certificate

L C I E

(A1) **ANNEXE**

(A1) **SCHEDULE**

(A2) **ATTESTATION D'EXAMEN CE DE TYPE**

LCIE 03 ATEX 6010 X (suite)

(A2) **EC TYPE EXAMINATION CERTIFICATE**

LCIE 03 ATEX 6010 X (continued)

Le marquage CE est accompagné du numéro d'identification de l'organisme notifié responsable de la surveillance du système approuvé de qualité (0081 pour le LCIE).

The CE marking shall be accompanied by the identification number of the notified body responsible for surveillance of the approved quality system (0081 for LCIE).

Le matériel devra également comporter le marquage normalement prévu par les normes de construction du matériel électrique concerné.

The equipment must also carry the usual marking required by the manufacturing standards applying to such equipments.

(A4) Documents descriptifs :

(A4) Descriptive documents :

Dossier technique N°4.271-5894/4 Rev 0 du 2/12/2002
Ce document comprend 7 rubriques (20 pages).

Technical file N°4.271-5894/4 Rev 0 du December 2nd, 2002
This file includes 7 items (20 pages).

Dossier technique N°4.271-5895/4 Rev 0 du 2/12/2002
Ce document comprend 12 rubriques (38 pages).

Technical file N°4.271-5895/4 Rev 0 du December 2nd, 2002
This file includes 12 items (38 pages).

(A5) Conditions spéciales pour une utilisation sûre :

(A5) Special conditions for safe use:

L'échantillon transféré dans l'analyseur ne pourra contenir de produits inflammables au-dessus de 25% de la LEL que dans les conditions définies dans les documents du constructeur.

Any sampling transfers into the cabinet containing flammable materials above 25 % of the LEL are permitted only according to the manufacturer documentation.

Les conditions spéciales pour une utilisation sûre relèvent des certificats concernés.

The special conditions for safe use concern the concerned certificates.

(A6) Exigences essentielles en ce qui concerne la sécurité et la santé :

(A6) Essential Health and Safety Requirements:

Conformité aux normes européennes EN 50014 (1997 + amendements 1 et 2), EN50016 (1995) and EN 50020 (1994).

Conformity to the European standards EN 50014 (1997 + amendments 1 and 2), EN50016 (1995) and EN 50020 (1994).

Epreuve individuelle :

Routine test :

Essai de surpression (§15.1) et essai de fuite (§15.2) conformément à la norme EN50016.

Overpressure test (§15.1) and leakage test (§15.2) according to the standard EN50016.

Les vérifications et épreuves individuelles relèvent des certificats concernés.

The verification and routine tests concerns the relevant certificates.

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A-2-1 Category 2 Certificate

(A1) **ATTESTATION D'EXAMEN CE DE TYPE**
LCIE 03 ATEX 6010 X du 06 Février 2003

AVENANT 03 ATEX 6010 X/01

(A2) DESIGNATION DE L'EQUIPEMENT OU DU SYSTEME DE PROTECTION :

Analyseur de gaz

Type : BINOS 100F & MLT 2

Demandeur : EMERSON PROCESS MANAGEMENT Manufacturing GmbH & Co. OHG

(A3) OBJET DE L'AVENANT, DESCRIPTION DE L'APPAREIL OU DU SYTEME DE PROTECTION :

- Modification de l'enveloppe et de la distribution des gaz.
- Adjonction d'une version 90 mbars
- Changement de nom de l'entreprise
- Remplacement de la carte électronique BKS10 par BKS20 (BINOS 100 F)
- Remplacement des cartes électroniques PIC/PSV par DSP (MLT2)
- Adjonction d'un nouveau principe de mesure TO2.
- Adjonction de la carte électronique FIP01

Marquage : Inchangé, excepté les suivants

Demandeur : EMERSON PROCESS MANAGEMENT Manufacturing GmbH & Co. OHG

Pour les modèles BINOS 100 F & MLT 2 (Enveloppe simple), balayage standard :
Volume interne libre : 56,1 L
Débit minimum de balayage : 6.8 Nm^3/h
Temps de balayage : 4 min.
Surpression minimale de l'enveloppe : 1 mbar
Débit de fuite maximale : ≤ 180 Nl / h
Surpression maximale : 25 mbar

Pour le modèle MLT 2 (Enveloppe double), balayage standard :
Volume interne libre : 112 L
Débit minimum de balayage : 9.2 Nm^3/h
Temps de balayage : 6 min.
Surpression minimale de l'enveloppe : 1 mbar
Débit de fuite maximale : ≤ 270 Nl / h
Surpression maximale : 25 mbar

Pour les modèles BINOS 100 F & MLT 2 (Enveloppe simple), balayage haute pression :
Volume interne libre : 56,1 L
Débit minimum de balayage : 1.75 Nm^3/h
Temps de balayage : 10 min.
Surpression minimale de l'enveloppe : 1 mbar
Débit de fuite maximale : ≤ 180 Nl / h
Surpression maximale : 95 mbar

(A1) **EC TYPE EXAMINATION CERTIFICATE**
LCIE 03 ATEX 6010 X dated February 06th, 2003

VARIATION 03 ATEX 6010 X/01

(A2) NAME OF EQUIPMENT OR PROTECTIVE SYSTEM :

Gas analyser

Type : BINOS 100F & MLT 2

Applicant : EMERSON PROCESS MANAGEMENT Manufacturing GmbH & Co. OHG

(A3) SUBJECT OF THE VARIATION, DESCRIPTION OF EQUIPMENT OR PROTECTIVE SYSTEM :

- Modification of the enclosure and gas distribution
- Adjunction of a type 90 mbars.
- Change of the company name
- Replace electronics board BKS 10 by BKS 20 (BINOS 100 F).
- Replace electronics boards PIC/PSV by DSP (MLT 2)
- Addition of a new measuring principle TO2.
- Addition of a new electronic board FIP01

Marking : Unchanged except the following.

Applicant: EMERSON PROCESS MANAGEMENT Manufacturing GmbH & Co. OHG

For types BINOS 100 F & MLT 2 (Single enclosure), standard purging :
Internal free volume : 56,1 L
Minimum purging flow rate : 6.8 Nm^3/h
Minimum purging duration : 4 min.
Minimum overpressure of the enclosure : 1 mbar
Maximum leakage flow rate : ≤ 180 Nl / h
Maximum overpressure : 25 mbar

For type MLT 2 (Dual enclosure), standard purging :
Internal free volume : 112 L
Minimum purging flow rate : 9.2 Nm^3/h
Minimum purging duration : 6 min.
Minimum overpressure of the enclosure : 1 mbar
Maximum leakage flow rate : ≤ 270 Nl / h
Maximum overpressure : 25 mbar

For types BINOS 100 F & MLT 2 (Single enclosure), purging high pressure :
Internal free volume : 56,1 L
Minimum purging flow rate : 1.75 Nm^3/h
Minimum purging duration : 10 min.
Minimum overpressure of the enclosure : 1 mbar
Maximum leakage flow rate : ≤ 180 Nl / h
Maximum overpressure : 95 mbar

LCIE
Laboratoire Central
des Industries Electriques
Une société de Bureau Veritas

A-2-1 Category 2 Certificate

(A1) **ATTESTATION D'EXAMEN CE DE TYPE**
LCIE 03 ATEX 6010 X du 06 Février 2003

AVENANT 03 ATEX 6010 X/01

Pour le modèle MLT 2 (Enveloppe double), balayage haute pression :

Volume interne libre : 112 L
Débit minimum de balayage : 1.92 Nm^3/h
Temps de balayage : 14 min.
Surpression minimale de l'enveloppe : 1 mbar
Débit de fuite maximale : ≤ 270 Nl / h

Surpression maximale : 95 mbar

(A4) DOCUMENTS DESCRIPTIFS :

Dossier technique N° 4.271-6321/4 Rév. 0 du 13/09/2004.

Ce dossier comprend 18 rubriques (62 pages).

(A5) CONDITIONS SPECIALES POUR UNE UTILISATION SURE :

Inchangées :

(A6) VERIFICATIONS ET EPREUVES INDIVIDUELLES :

Inchangées,

(A7) EXIGENCES ESSENTIELLES EN CE QUI CONCERNE LA SECURITE ET LA SANTE :

Inchangées.

(A1) **EC TYPE EXAMINATION CERTIFICATE**
LCIE 03 ATEX 6010 X dated February 06th, 2003

VARIATION 03 ATEX 6010 X/01

For type MLT 2 (Dual enclosure), purging high pressure :

Internal free volume : 112 L
Minimum purging flow rate : 1.92 Nm^3/h
Minimum purging duration : 14 min.
Minimum overpressure of the enclosure : 1 mbar
Maximum leakage flow rate : ≤ 270 Nl / h

Maximum overpressure : 95 mbar

(A4) DESCRIPTIVE DOCUMENTS :

Technical file No. 4.271-6321/4 Rev. 0 dated September, 13th, 2004.

This file includes 18 items (62 pages).

(A5) SPECIAL CONDITIONS FOR SAFE USE :

Unchanged :

(A6) INDIVIDUAL EXAMINATIONS AND TESTS :

Unchanged,

(A7) ESSENTIAL HEALTH AND SAFETY REQUIREMENTS :

Unchanged.

Fontenay-aux-Roses, le 24 septembre 2004

Le Directeur de l'organisme certificateur
Manager of the certification body

Michel BRÉNON

Timbre sec/dry seal

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A-2-2 Category 3 Certificate

L C I E

1 **ATTESTATION D'EXAMEN DE TYPE**

2 Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles
Directive 94/9/CE

3 Numéro de l'attestation de type
LCIE 03 ATEX 6011 X

4 Appareil :

Analyseur de gaz
Type : BINOS 100 F & MLT 2

5 Demandeur : Fisher-Rosemount MFG Gmbh & Co. OHG

6 Adresse : Industriestrasse 1
63594 Hasselroth - Germany

7 Cet appareil et ses variantes éventuelles acceptées est décrit dans l'annexe de la présente attestation et dans les documents descriptifs cités en annexe.

8 Le LCIE certifie que cet appareil est conforme aux exigences essentielles en ce qui concerne la sécurité et la santé pour la conception et la construction d'appareils de catégorie 3 destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive. Les vérifications et épreuves figurent dans notre rapport confidentiel N° 39435010.

9 Le respect des exigences essentielles en ce qui concerne la sécurité et la santé est assuré par la conformité aux documents suivants :
- EN 50014 (1997) + amendements 1 et 2
- EN 50016 (1995)
- EN 50020 (1994)

10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que ce matériel est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 La présente attestation d'examen de type porte uniquement sur la conception, l'examen et l'essai de l'équipement ou du système de protection spécifié conformément à la directive 94/9/CE.
Toutes autres exigences de la Directive peuvent être d'application au procédé de fabrication et de livraison de cet équipement ou système de protection. Ils ne sont pas couverts par la présente attestation.

12 Le marquage de l'appareil devra comporter, entre autres indications utiles, les mentions suivantes :

II 3 G
EEx p ia [ia] IIC T4

Fontenay-aux-Roses, le 6 février 2003

1 **TYPE EXAMINATION CERTIFICATE**

2 Equipment or protective system intended for use in Potentially explosive atmospheres
Directive 94/9/EC

3 Type Examination Certificate number
LCIE 03 ATEX 6011 X

4 Equipment :

Gas analyser
Type : BINOS 100 F & MLT 2

5 Applicant : Fisher-Rosemount MFG Gmbh & Co. OHG

6 Address : Industriestrasse 1
63594 Hasselroth - Germany

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein refered to.

8 LCIE certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of category 3 equipment intended for use in potentially explosive atmospheres, given in Annex II to the directive. The examination and test results are recorded in confidential report No 39435010.

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with :

- EN 50014 (1997) + amendements 1 et 2
- EN 50016 (1995)
- EN 50020 (1994)

10 If the sign X is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This Type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC.
Further requirements of the Directive may apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment shall include the following :

II 3 G
EEx p ia [ia] IIC T4

Par délégation
Michel BRÉNON
Directeur adjoint
à la Certification

Le Directeur de l'organisme certificateur
Manager of the certification body

Timbre sec/dry seal

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LCIE — 33, av. du Général Leclerc — Tél : +33 1 40 95 60 60 — Société anonyme à directoire
Laboratoire Central — BP 8 — Fax : +33 1 40 95 86 56 — et conseil de surveillance
des Industries Electriques — 92260 Fontenay aux Roses cedex — contact@lcie.fr — au capital de 15 715 984 €
Une société de Bureau Veritas — France — www.lcie.fr — RCS Nanterre B 408 365 174

A-2-2 Category 3 Certificate

(A1) **ANNEXE**

(A2) **ATTESTATION D'EXAMEN DE TYPE**
LCIE 03 ATEX 6011 X

(A3) Description de l'équipement

L'analyseur de gaz BINOS 100 F combine un module de mesure par infrarouge (NDIR), par thermo-conductivité (TC) et/ou par capteur d'oxygène paramagnétique (PO2) ou électrochimique (EO2). L'ensemble de mesure se compose de un ou deux canaux et est contenu dans une enveloppe pressurisée.

L'analyseur de gaz MLT 2 à enveloppe simple ou double combine jusqu'à cinq canaux de mesure utilisant l'infrarouge (NDIR), l'ultraviolet (UV), un capteur d'oxygène paramagnétique (PO2) ou électrochimique (EO2) et un module de thermo-conductivité (TC). Les différents modules de mesure sont installés dans un enveloppe pressurisée.

Les deux analyseurs type BINOS 100 F ou MLT 2 peuvent être utilisés en zone 2 avec un module de pressurisation certifié zone 2

Les paramètres électriques sont les suivants :

Tension d'alimentation : 120 / 230 VAC, 50 / 60Hz
Puissance maximale dissipée: 1000 VA

Le marquage est le suivant :

Fisher-Rosemount MFG Gmbh & Co. OHG
Adresse
Type : ...
Numéro de fabrication
Année de construction
03 ATEX 6011 X
⟨Ex⟩ II 3G
EEx p Ia [ia] IIC T4

Pour les modèles BINOS 100 F & MLT 2 (Enveloppe simple) :
Volume interne libre : 56,1 L
Débit minimum de balayage : 8 Nm^3/h
Temps de balayage : 5 min.
Surpression minimale de l'enveloppe : 1 mbar
Débit de fuite maximale : 22 Nm^3/h
Surpression maximale : 25 mbar

Pour le modèle MLT 2 (Enveloppe double) :
Volume interne libre : 112 L
Débit minimum de balayage : 7 Nm^3/h
Temps de balayage : 17 min.
Surpression minimale de l'enveloppe : 1 mbar
Débit de fuite maximale : 22 Nm^3/h
Surpression maximale : 25 mbar

NE PAS OUVRIR EN PRESENCE D'ATMOSPHERE EXPLOSIBLE

Les symboles "ia", "[ia]" du marquage général devront être indiqués ou supprimés en fonction des composants intégrés dans l'enveloppe "p".

(A1) **SCHEDULE**

(A2) **TYPE EXAMINATION CERTIFICATE**
LCIE 03 ATEX 6011 X

(A3) Description of Equipment

The gas analyser BINOS 100 F combines Infrared (NDIR) measurement, thermal conductivity (TC) measurement and/or paramagnetic (PO2) or electrochemical (EO2) oxygen sensors as single or dual channel instrument in a pressurized housing.

The single or dual enclosure gas analyser MLT 2 combines up to five measuring channels using Infrared (NDIR), ultraviolet (UV), paramagnetic (PO2) or electrochemical (EO2) oxygen sensors and thermal conductivity (TC) measurement principles in a pressurized housing.

Both analysers type BINOS 100 F or MLT 2 may be used in zone 2 with a zone 2 purge system.

The electrical parameters are the following :

Supply voltage : 120 / 230 VAC, 50 / 60 Hz
Maximal dissipated power : 1000 VA

The marking is the following :

Fisher-Rosemount MFG Gmbh & Co. OHG
Address
Type : ...
Serial number
Year of construction
03 ATEX 6011 X
⟨Ex⟩ II 3G
EEx p Ia [ia] IIC T4

For types BINOS 100 F & MLT 2 (Single enclosure) :
Internal free volume : 56,1 L
Minimum purging flow rate : 8 Nm^3/h
Minimum purging duration : 5 min.
Minimum overpressure of the enclosure : 1 mbar
Maximum leakage flow rate : 22 Nm^3/h
Maximum overpressure : 25 mbar

For type MLT 2 (Dual enclosure) :
Internal free volume : 112 L
Minimum purging flow rate : 7 Nm^3/h
Minimum purging duration : 17 min.
Minimum overpressure of the enclosure : 1 mbar
Maximum leakage flow rate : 22 Nm^3/h
Maximum overpressure : 25 mbar

DO NOT OPEN IN PRESENCE OF HAZARDOUS ATMOSPHERE

The acronyms "ia", "[ia]" of the general marking must be indicated or removed according to the integrated components inside the enclosure "p".

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A-2-2 Category 3 Certificate

(A1) **ANNEXE**

(A2) **ATTESTATION D'EXAMEN DE TYPE**
LCIE 03 ATEX 6011 X

Le matériel devra également comporter le marquage normalement prévu par les normes de construction du matériel électrique concerné.

(A4) Documents descriptifs

Dossier technique N°4.271-5894/4 Rev 0 du 2/12/2002
Ce document comprend 7 rubriques (20 pages).

Dossier technique N°4.271-5895/4 Rev 0 du 2/12/2002
Ce document comprend 12 rubriques (38 pages).

(A5) Conditions spéciales pour une utilisation sûre

L'échantillon transféré dans l'analyseur ne pourra contenir de produits inflammables au-dessus de 25% de la LEL que dans les conditions définies dans les documents du constructeur.

Les conditions spéciales pour une utilisation sûre relèvent des certificats concernés.

(A6) Exigences essentielles en ce qui concerne la sécurité et la santé

Conformité aux normes européennes EN 50014 (1997 + amendements 1 et 2), EN50016 (1995) and EN 50020 (1994).

Epreuve individuelle :

Essai de surpression (§15.1) et essai de fuite (§15.2) conformément à la norme EN50016.

Les vérifications et épreuves individuelles relèvent des certificats concernés.

(A1) **SCHEDULE**

(A2) **TYPE EXAMINATION CERTIFICATE**
LCIE 03 ATEX 6011 X

The equipment must also carry the usual marking required by the manufacturing standards applying to such equipments.

(A4) Descriptive documents :

Technical file N°4.271-5894/4 Rev 0 du December 2nd, 2002
This file includes 7 items (20 pages).

Technical file N°4.271-5895/4 Rev 0 du December 2nd, 2002
This file includes 12 items (38 pages).

(A5) Special conditions for safe use

Any sampling transfers into the cabinet containing flammable materials above 25 % of the LEL are permitted only according to the manufacturer documentation.

The special conditions for safe use concern the concerned certificates.

(A6) Essential Health and Safety Requirements

Conformity to the European standards EN 50014 (1997 + amendments 1 and 2), EN50016 (1995) and EN 50020 (1994).

Routine test :

Overpressure test (§15.1) and leakage test (§15.2) according to the standard EN50016.

The verification and routine tests concerns the relevant certificates.

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A-2-2 Category 3 Certificate

(A1) **ATTESTATION D'EXAMEN DE TYPE**
LCIE 03 ATEX 6011 X du 06 Février 2003

AVENANT 03 ATEX 6011 X/01

(A2) DESIGNATION DE L'EQUIPEMENT OU DU SYSTEME DE PROTECTION :

Analyseur de gaz

Type : BINOS 100F & MLT 2

Demandeur : EMERSON PROCESS MANAGEMENT Manufacturing GmbH & Co. OHG

(A3) OBJET DE L'AVENANT, DESCRIPTION DE L'APPAREIL OU DU SYTEME DE PROTECTION :

- Modification de l'enveloppe
- Changement de nom de l'entreprise
- Remplacement de la carte électronique BKS10 par BKS20 (BINOS 100 F)
- Remplacement des cartes électroniques PIC/PSV par DSP (MLT2).
- Adjonction d'un nouveau principe de mesure TO2.
- Adjonction de la carte électronique FIP01

Marquage : Inchangé, excepté les suivants

Demandeur : EMERSON PROCESS MANAGEMENT Manufacturing GmbH & Co. OHG

Pour les modèles BINOS 100 F & MLT 2 (Enveloppe simple) :

Volume interne libre : 56,1 L
Débit de fuite maximale : ≤ 180 Nl / h

Pour le modèle MLT 2 (Enveloppe double) :

Volume interne libre : 112 L
Débit de fuite maximale : ≤ 270 Nl / h

(A4) DOCUMENTS DESCRIPTIFS :

Dossier technique N° 4.271-6321/4 Rév. 0 du 13/09/2004.

Ce dossier comprend 18 rubriques (62 pages).

(A5) CONDITIONS SPECIALES POUR UNE UTILISATION SURE :

Inchangées :

(A1) **TYPE EXAMINATION CERTIFICATE**
LCIE 03 ATEX 6011 X dated February 06th, 2003

VARIATION 03 ATEX 6011 X/01

(A2) NAME OF EQUIPMENT OR PROTECTIVE SYSTEM :

Gas analyser

Type : BINOS 100F & MLT 2

Applicant : EMERSON PROCESS MANAGEMENT Manufacturing GmbH & Co. OHG

(A3) SUBJECT OF THE VARIATION, DESCRIPTION OF EQUIPMENT OR PROTECTIVE SYSTEM :

- Modification of the enclosure
- Change of the company name
- Replace electronics board BKS 10 by BKS 20 (BINOS 100 F).
- Replace electronics boards PIC/PSV by DSP (MLT 2).
- Addition of a new measuring principle TO2.
- Addition of a new electronic board FIP01

Marking : Unchanged except the following.

Applicant: EMERSON PROCESS MANAGEMENT Manufacturing GmbH & Co. OHG

For types BINOS 100 F & MLT 2 (Single enclosure) :

Internal free volume : 56,1 L
Maximum leakage flow rate : ≤ 180 Nl / h

For type MLT 2 (Dual enclosure) :

Internal free volume : 112 L
Maximum leakage flow rate : ≤ 270 Nl / h

(A4) DESCRIPTIVE DOCUMENTS :

Technical file No. 4.271-6321/4 Rev. 0 dated September, 13th , 2004.

This file includes 18 items (62 pages).

(A5) SPECIAL CONDITIONS FOR SAFE USE :

Unchanged

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A-2-2 Category 3 Certificate

(A1) **ATTESTATION D'EXAMEN DE TYPE**
LCIE 03 ATEX 6011 X du 06 Février 2003

AVENANT 03 ATEX 6011 X/01

(A1) **TYPE EXAMINATION CERTIFICATE**
LCIE 03 ATEX 6011 X dated February 06th, 2003

VARIATION 03 ATEX 6011 X/01

(A6) VERIFICATIONS ET EPREUVES INDIVIDUELLES :

Inchangées,

(A6) INDIVIDUAL EXAMINATIONS AND TESTS :

Unchanged,

(A7) EXIGENCES ESSENTIELLES EN CE QUI CONCERNE LA SECURITE ET LA SANTE :

Inchangées.

(A7) ESSENTIAL HEALTH AND SAFETY REQUIREMENTS :

Unchanged.

Fontenay-aux-Roses, le 24 septembre 2004

Le Directeur de l'organisme certificateur
Manager of the certification body

Michel BRÉNON

Timbre sec/dry seal

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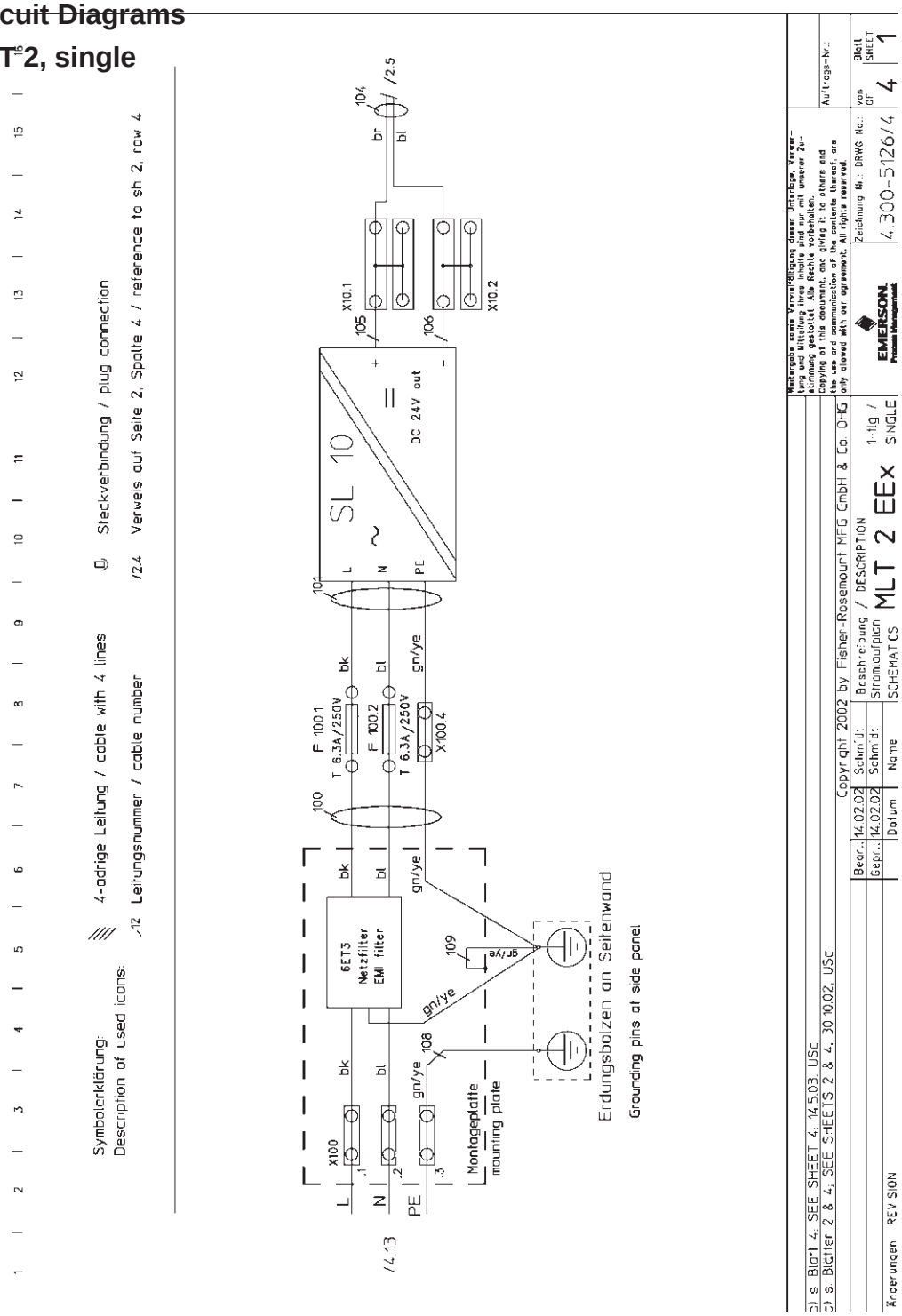
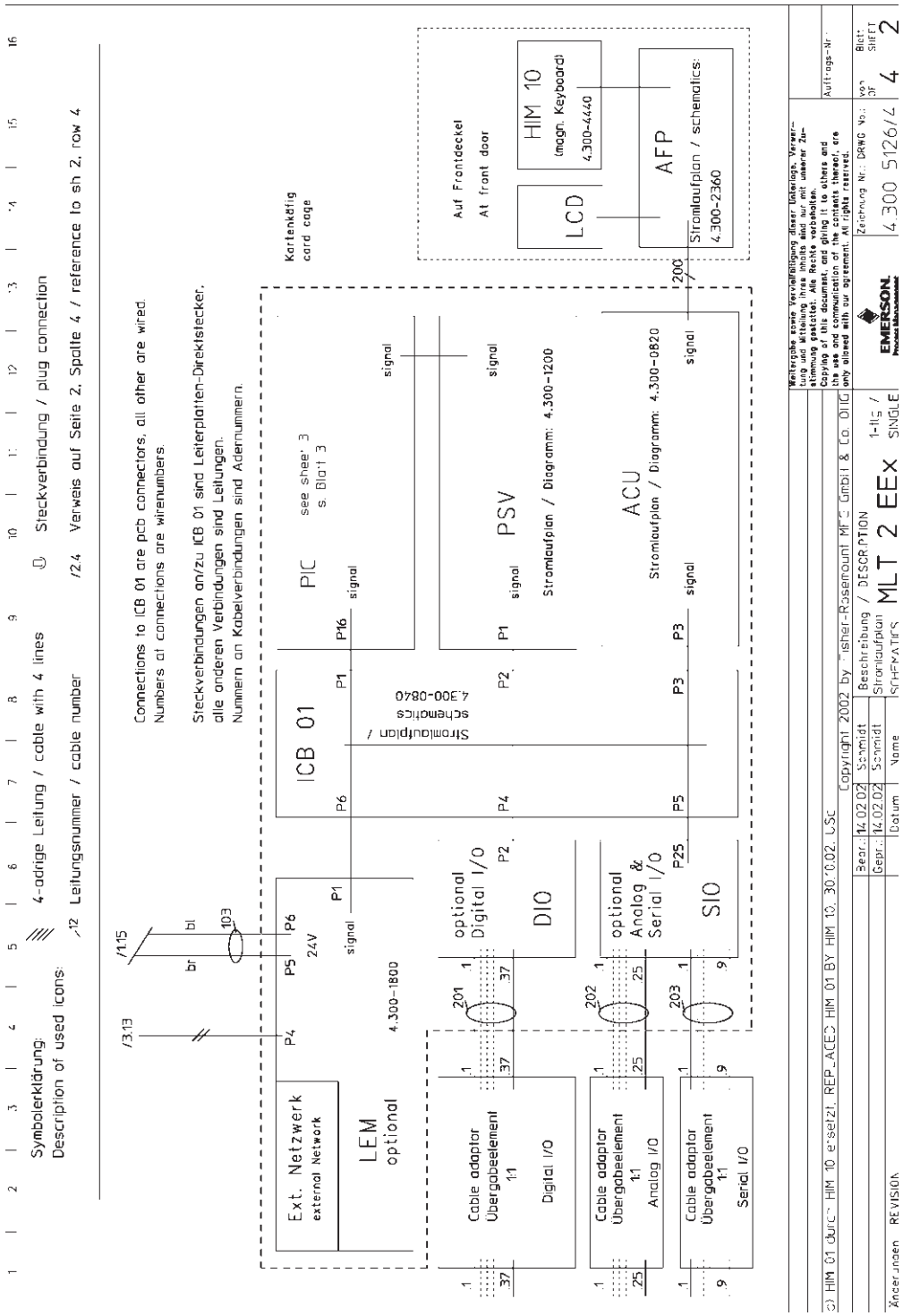
A-3 Circuit Diagrams

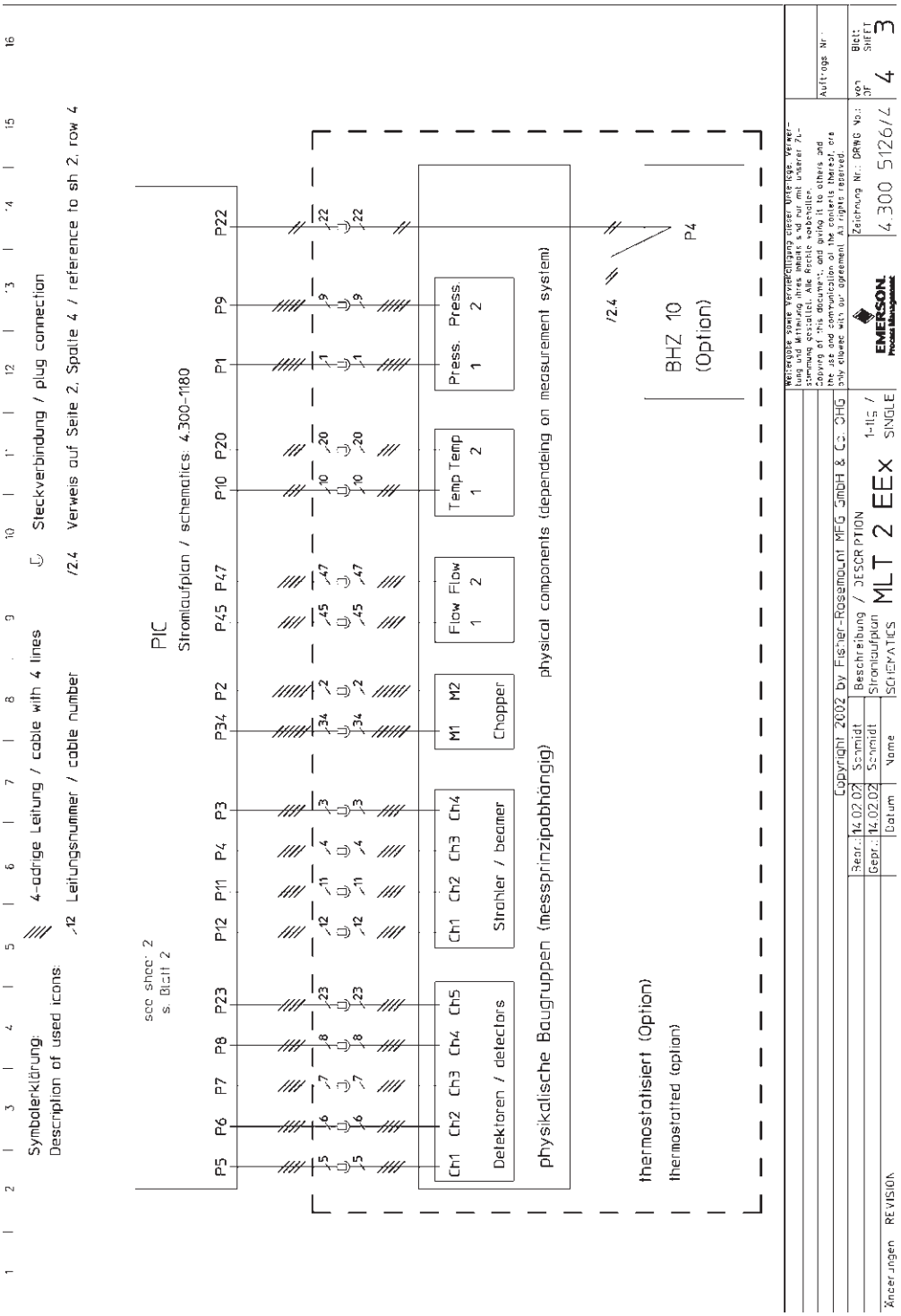
A-3-1 MLT 2, single



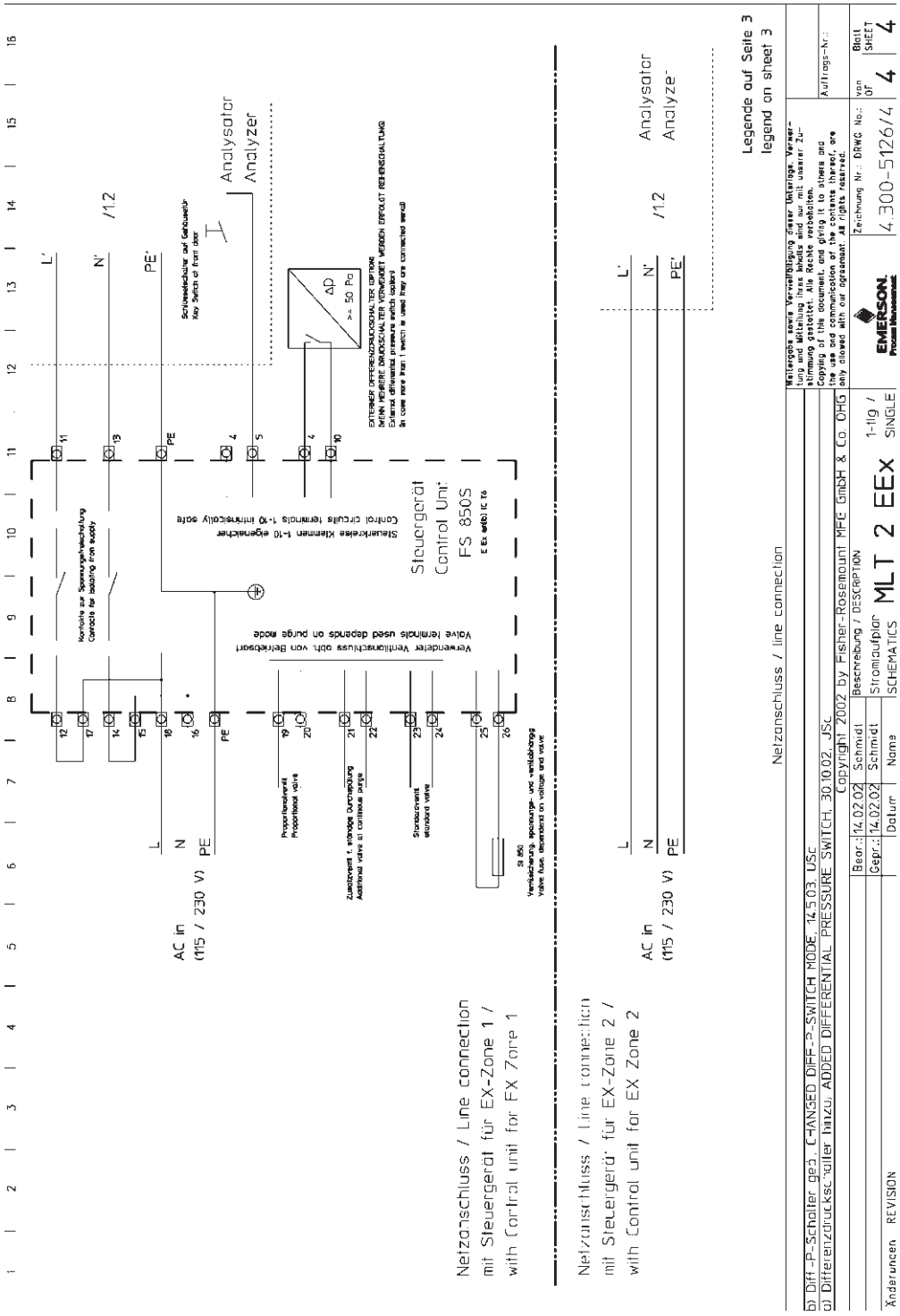
A-3-1 MLT 2 Circuit Diagrams



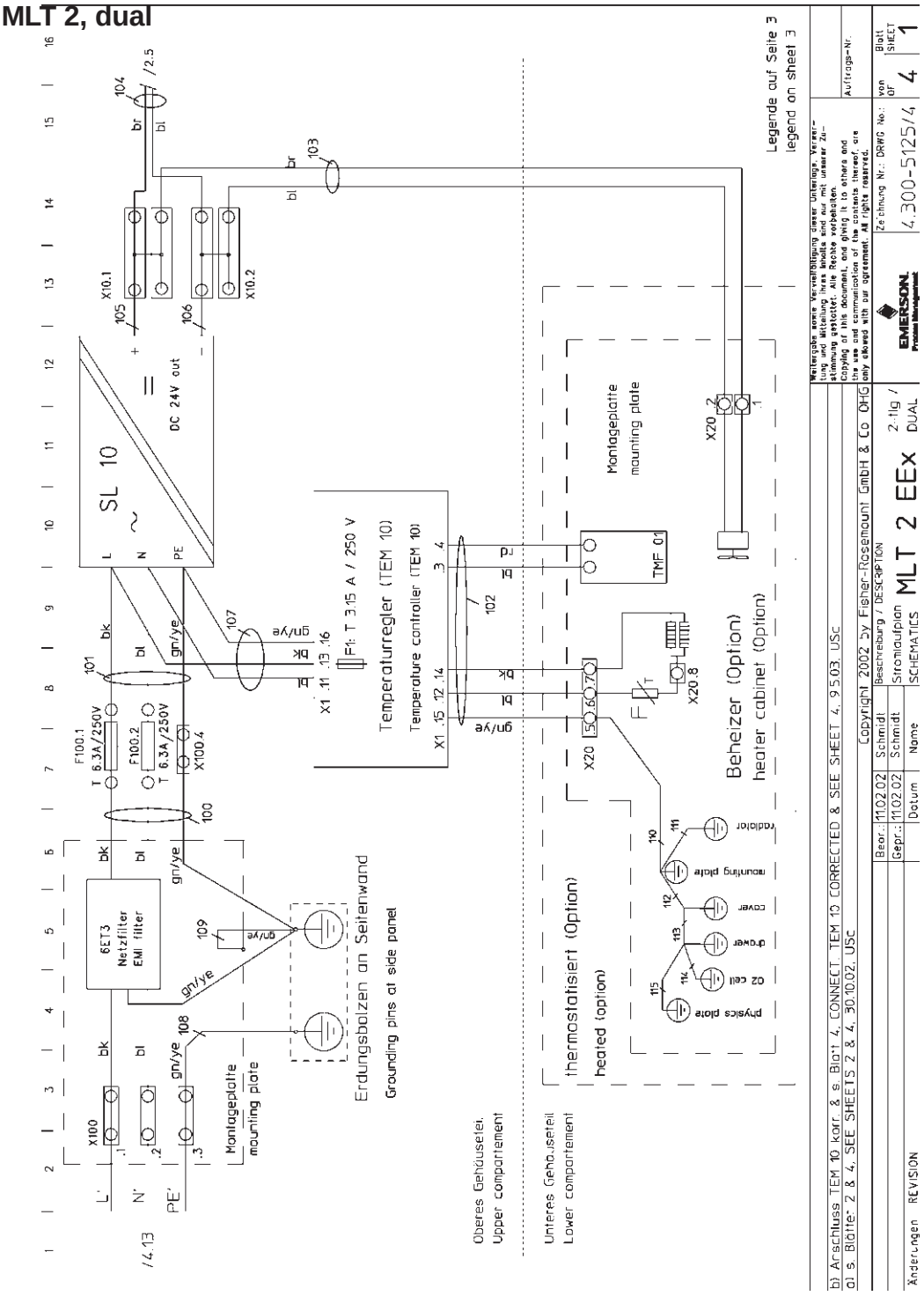
A-3-1 MLT 2 Circuit Diagrams



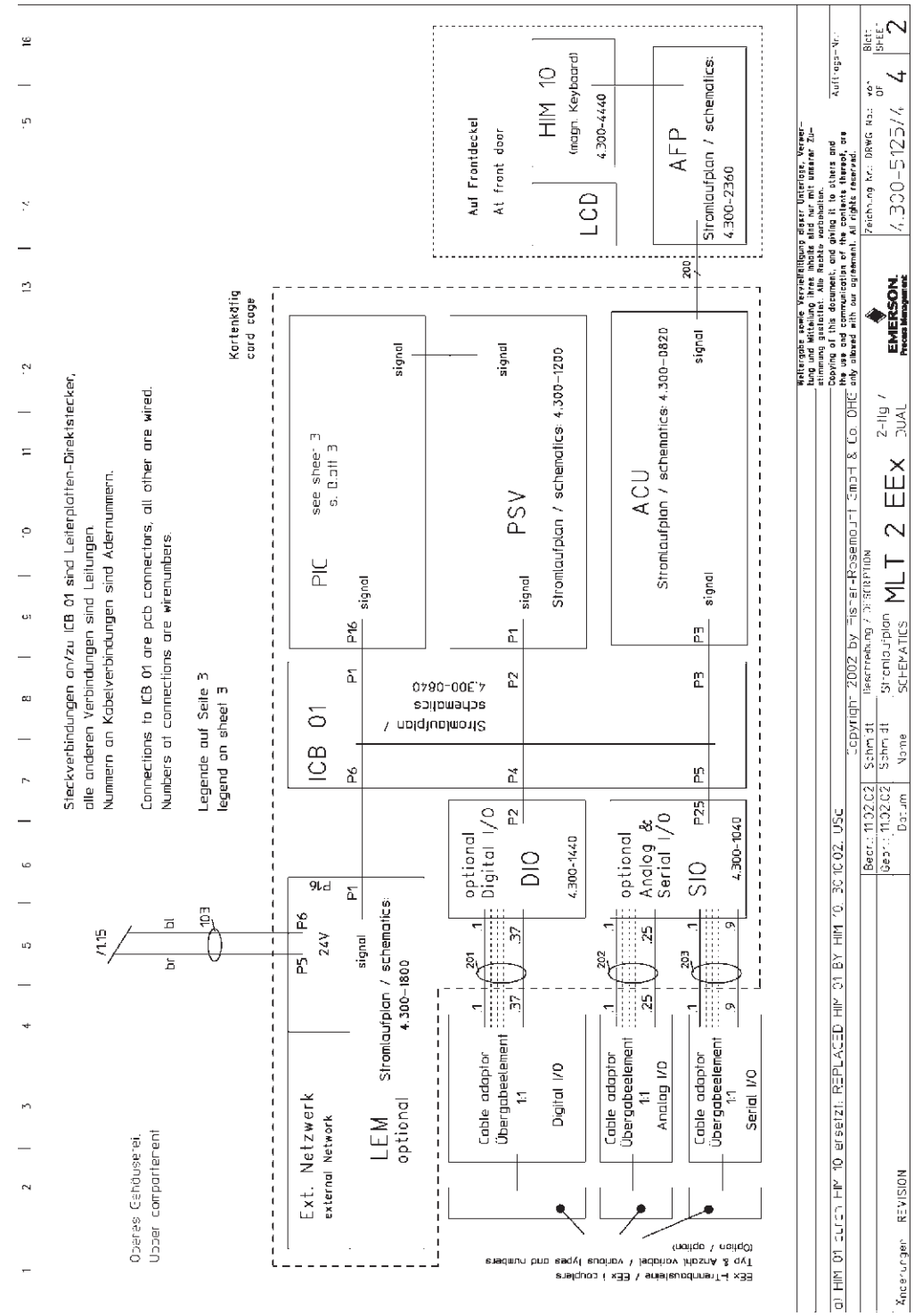
A-3-1 MLT 2 Circuit Diagrams



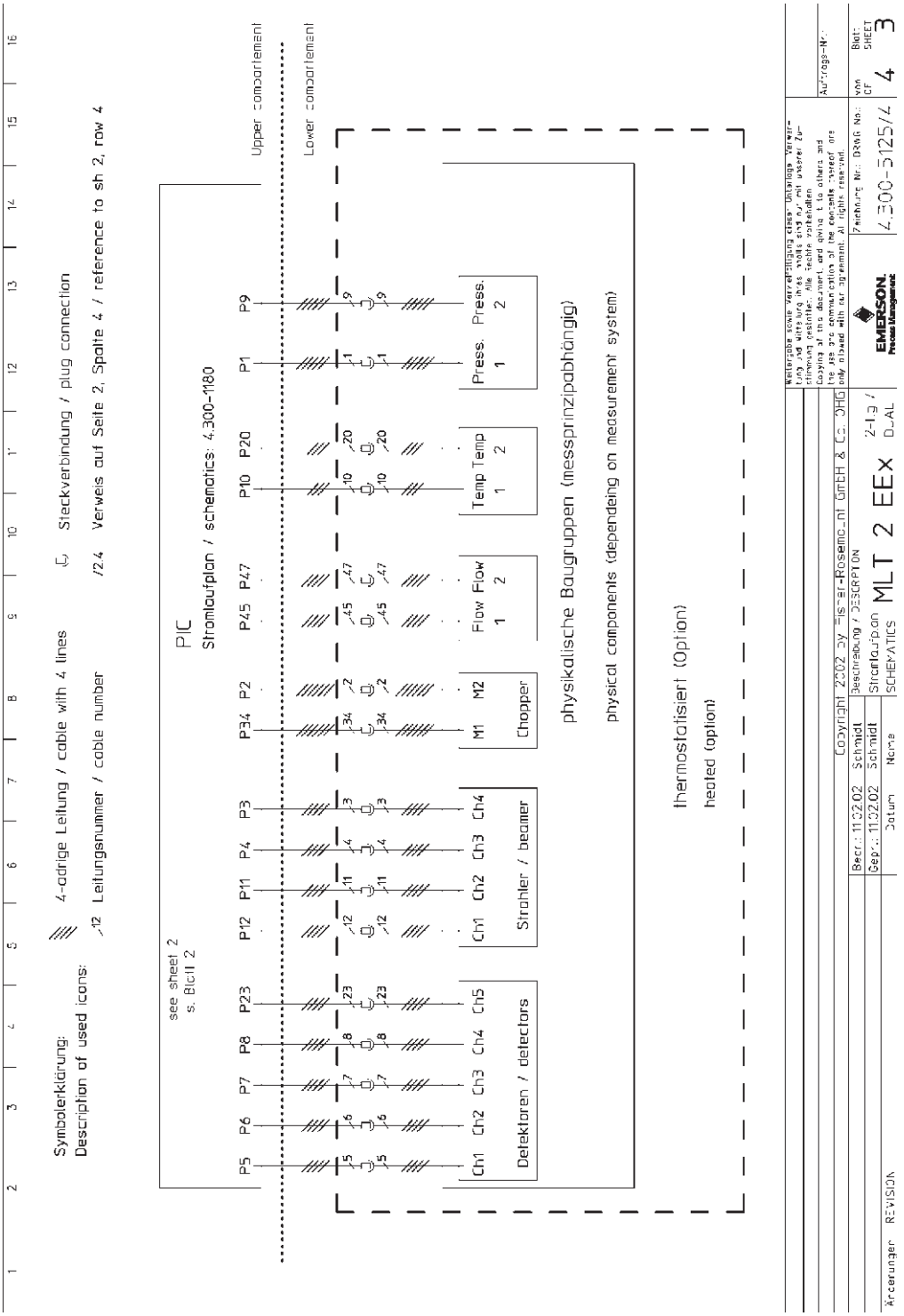
A-3-2 MLT 2, dual



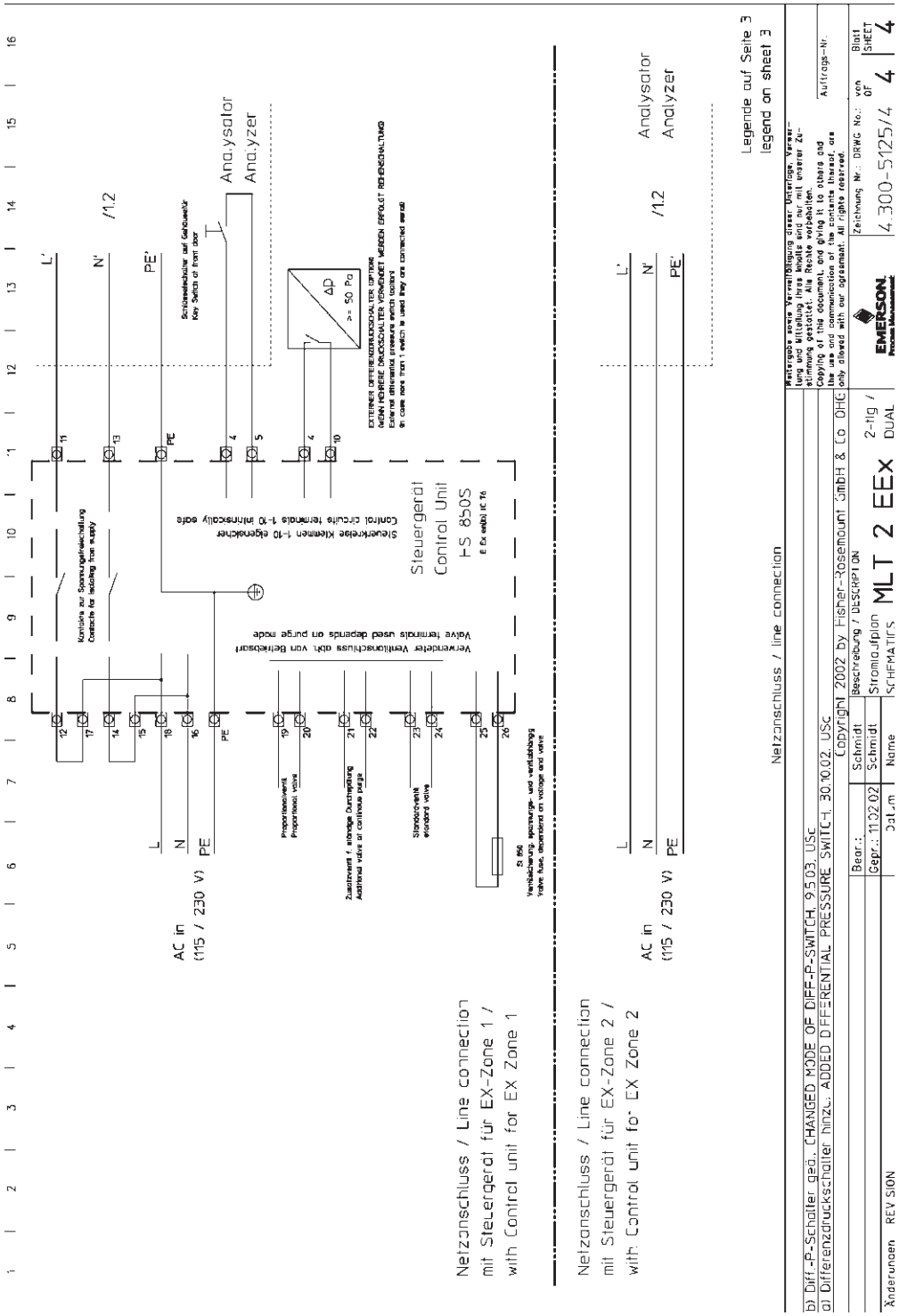
A-3-2 MLT 2 Circuit Diagrams



A-3-2 MLT 2 Circuit Diagrams

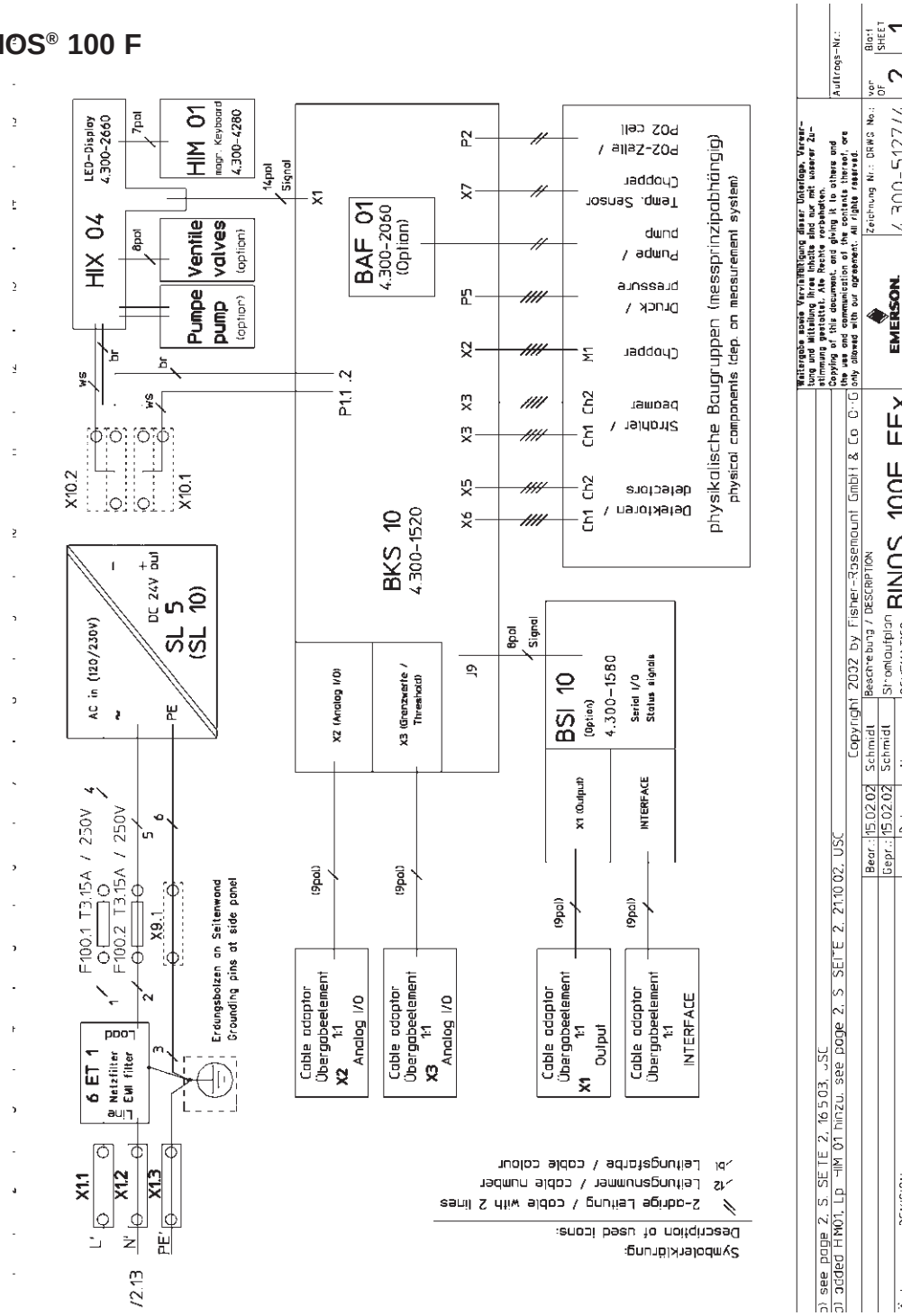


A-3-2 MLT 2 Circuit Diagrams

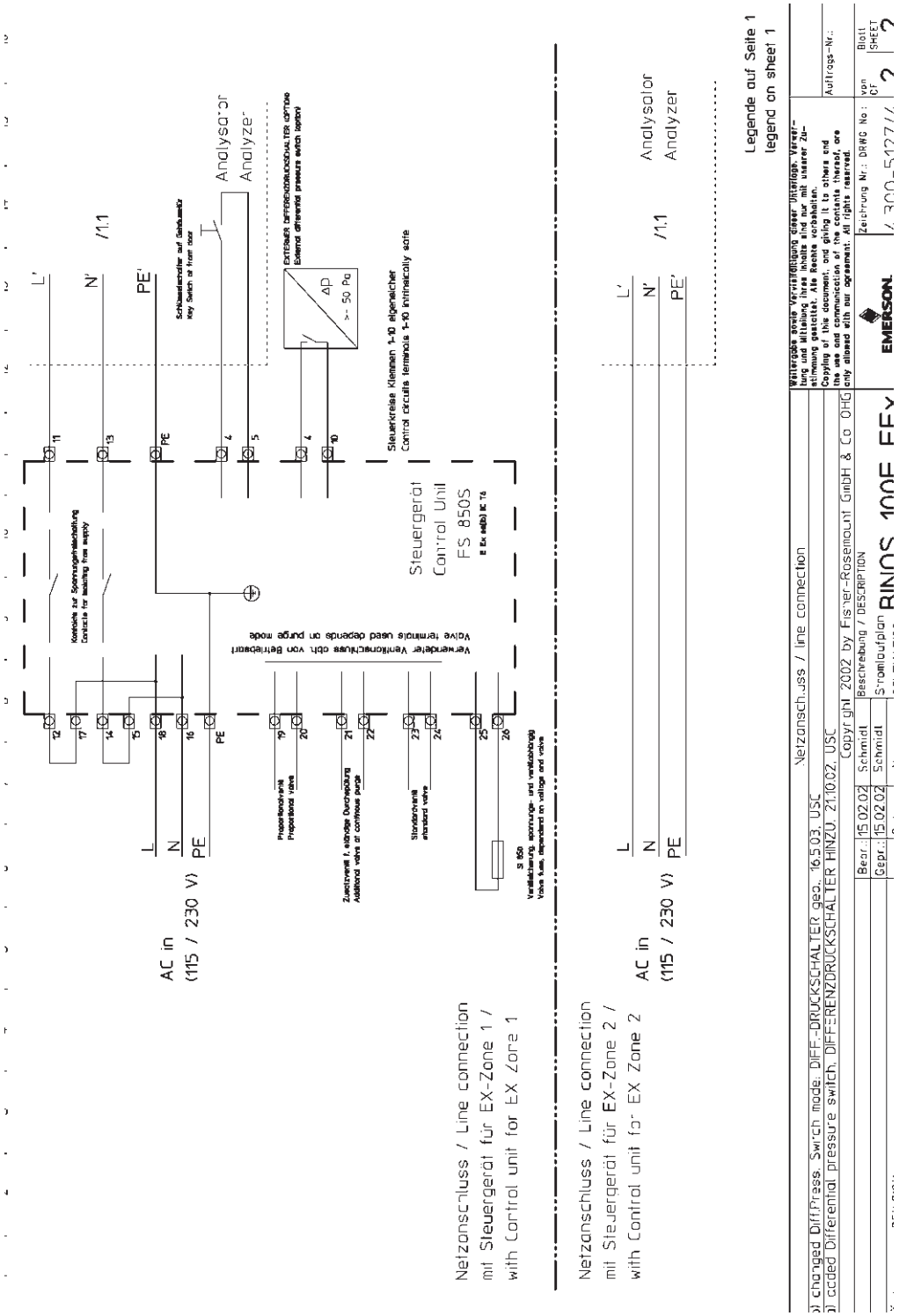


A-3-2 BINOS® 100 F Circuit Diagrams

A-3-3 BINOS® 100 F



A-3-2 BINOS® 100 F Circuit Diagrams



BINOS 100 F & MLT 2 Addendum Zone 1 & 2

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