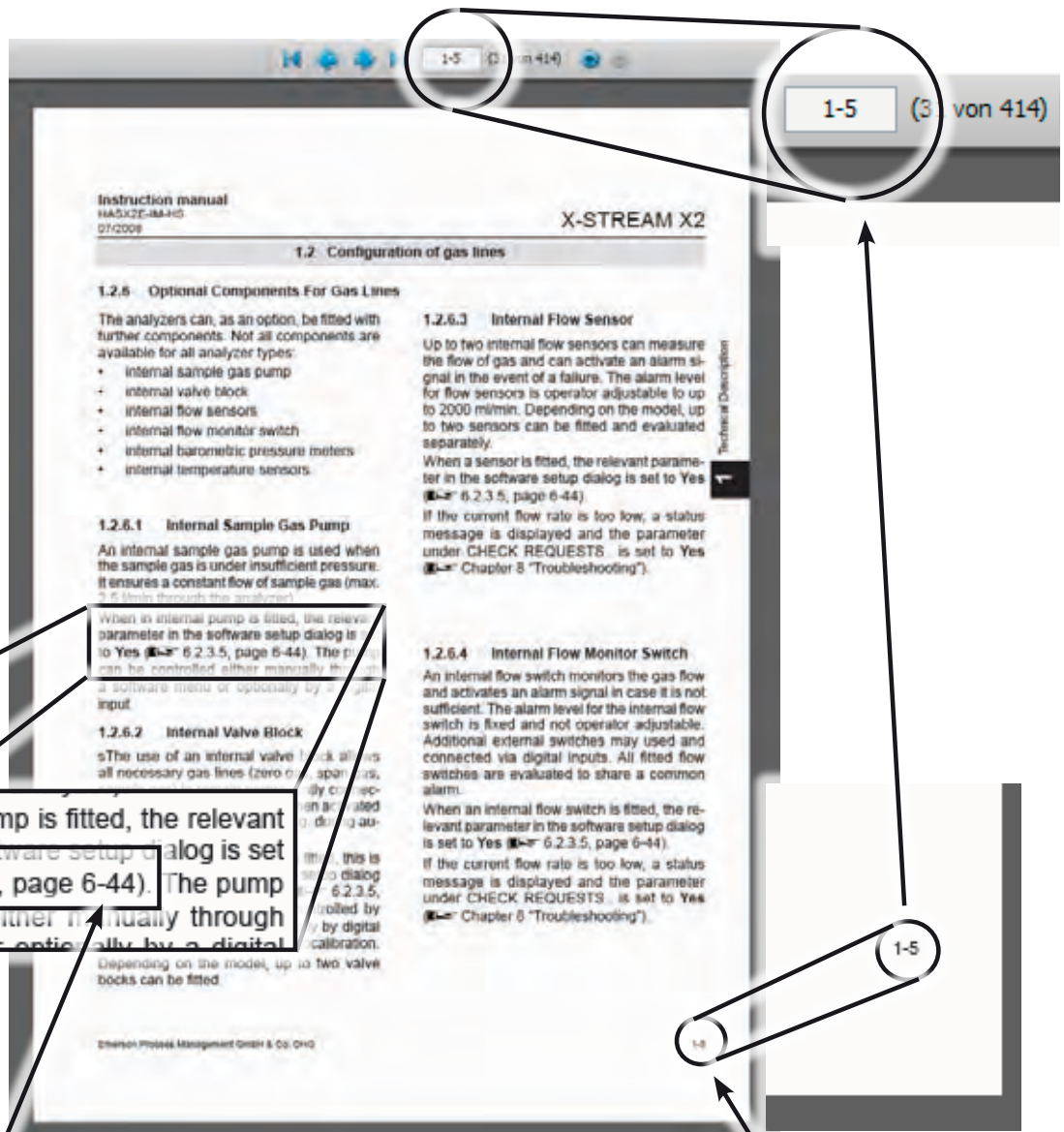


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Short Form Manual  
HASXEE-SFM-HS  
07/2010

# XSTREAM<sup>®</sup>

## Gas Analyzer Series

Short Form Manual



**ROSEMOUNT<sup>®</sup>**  
Analytical

[www.EmersonProcess.com](http://www.EmersonProcess.com)

  
**EMERSON<sup>™</sup>**  
Process Management

# 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.**

The information contained in this document is subject to change without notice.

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## INTRODUCTION

This short form manual provides information on installation and startup of the X-STREAM® XE series gas analyzers. For comprehensive instructions see the X-STREAM XE series instruction manual.


This manual covers several X-STREAM analyzer models and so may contain information about configurations and/or options not applicable to your analyzer.


The installation and operation of units for use in explosive (hazardous) environments is not covered in this manual.

Analyzers intended to be used in such environments are supplied with further instruction manuals, which should be consulted in addition to this.

## DEFINITIONS

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

|  |  |
|--|--|
|  |  <b>WARNING</b>   |
|  | <p><b>HIGHLIGHTS AN OPERATION OR MAINTENANCE PROCEDURE, PRACTICE, CONDITION, STATEMENT, ETC.</b></p> <p>If not strictly observed, could result in injury, death, or long-term health hazards of personnel.</p> |

|  |  |
|--|--|
|  |  <b>CAUTION</b>   |
|  | <p><b>HIGHLIGHTS AN OPERATION OR MAINTENANCE PROCEDURE, PRACTICE, CONDITION, STATEMENT, ETC.</b></p> <p>If not strictly observed, could result in damage to or destruction of equipment, or loss of effectiveness.</p> |

### **NOTE!**

*Highlights an essential operating procedure, condition or statement.*

## TERMS USED IN THIS INSTRUCTION MANUAL

### **Explosive Gas(es)**

Flammable Gases and gas mixtures in a mixture with air within the explosive limits.

### **Flammable Gas(es)**

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

### **Infallible Containment**

This term is derived from the standards of explosion protection especially from the requirements for pressurized housings: thus an infallible containment can be characterized by no intended leakage out of the gas paths enabling gas to enter the inner compartment of the analyzer housing.

### **Intrinsically Safe Cell (IS Cell)**

Cells supplied with an intrinsically safe power signal, approved by a Test Institute, to operate with explosive gases.

The design ensures the IS cells remains safe even in case of failure and explosive gases are not ignited.

### **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.

### **NAMUR**

NAMUR is an international user association of automation technology in process industries. This organisation has issued experience reports and working documents, called recommendations (NE) and worksheets (NA).

### **Protection Class IP66 / NEMA 4X**

Both terms are used to specify conditions for equipment to be installed outdoor.

**IP** stands for Ingress Protection, the first number specifies protection against solid objects (**6. = dust tight**) while the second number specifies the degree of protection against liquids (**.6 = heavy seas**).

**NEMA** stands for National Electrical Manufacturers Association. **4X** specifies a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water; and that will be undamaged by the external formation of ice on the enclosure

### **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.

Safety Instructions

**SYMBOLS USED ON AND INSIDE THE UNIT**

Wherever one or more of the following symbols appear on or inside the instrument, be careful and read the instructions given in the accompanying manuals!

**Strictly observe the given warnings, instructions and information to minimize hazards!**








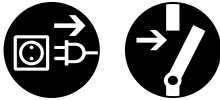


| This symbol at the instrument ...   | ... means  |
|---|--|
|    | <p><b>dangerous voltages</b> may be accessible. Removing covers is permitted only, if the instrument is disconnected from power - and even in this case by qualified personnel only!</p>                               |
|    | <p><b>hot surfaces</b> may be accessible. Removing covers by qualified personnel is permitted only, if the instrument is disconnected from power. Nevertheless several surfaces may remain hot for a limited time.</p> |
|  | <p><b>more detailed information available:</b> see instruction manual before proceeding!</p>   |
|  | <p><b>more detailed information available:</b> see instruction manual before proceeding!</p>   |

**Safety Instructions**

**SYMBOLS USED IN THIS MANUAL**

Where one or more of the following symbols appear within this manual, carefully read the related information and instructions!

**Strictly observe the given warnings, instructions and information to minimize hazards!**

| This symbol used in the manual ...  | ... means   |
|---|---|
|    | <b>dangerous voltages</b> may be exposed  |
|    | <b>hot surfaces</b> may be exposed  |
|   | possible <b>danger of explosion</b>   |
|  | <b>toxic substances</b> may be present  |
|  | <b>substances harmful to health</b> may be present  |
|  | indicates notes relating to <b>heavy instruments</b>  |
|  | electrical components may be destroyed by <b>electrostatic discharges</b>   |
|  | units must be <b>disconnected from the power source</b>   |
|  | indicates special instructions or information for operation at <b>low temperatures</b> .  |
|  | indicates basic conditions or procedures are being described.<br>This symbol may also indicate information important for achieving accurate measurements. |

Safety Instructions

**SAFETY INSTRUCTIONS**

**INTENDED USE STATEMENT**

X-STREAM XE series gas analyzers are intended to be used as analyzers for industrial purposes. They must not be used in medical, diagnostic or life support applications.

Using X-STREAM XE analyzers as safety devices is prohibited where redundancy and/or SIL classification or equivalent is needed.

No independent agency certifications or approvals are to be implied as covering such applications!

**GENERAL SAFETY NOTICE / RESIDUAL RISK**

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

Despite of incoming goods inspections, production control, routine tests and application of state-of-the-art measuring and test methods, an element of risk remains when operating a gas analyzer!

Even when operated as intended and observing all applicable safety instructions some residual risks remain, including, but not limited to, the following:

- An interruption of the protective earth line, e.g. in an extension cable, may result in risk to the user.
- Live parts are accessible when operating the instrument with doors open or covers removed.
- The emission of gases hazardous to health may even be possible when all gas connections have been correctly made.

Avoid exposure to the dangers of these residual risks by taking particular care when installing, operating, maintaining and servicing the analyzer.

## Safety Instructions

### AUTHORIZED PERSONNEL

In-depth specialist knowledge is an absolutely necessary condition for working with and on the analyzer.

Authorized personnel for installing, operating, servicing and maintaining the analyzer are instructed and trained qualified personnel of the operating company and the manufacturer.

It is the responsibility of the operating company to

- train staff,
- observe safety regulations,
- follow the instruction manual.

Operators must

- have been trained,
- have read and understood all relevant sections of the instruction manual before commencing work,
- know the safety mechanisms and regulations.

To avoid personal injury and loss of property, do not install, operate, maintain or service this instrument before reading and understanding this instruction manual and receiving appropriate training.

### ADDITIONAL LITERATURE

This manual covers aspects important for installation and startup of X-STREAM XE gas analyzers.

For comprehensive information on operating and maintain/service the instrument in a safe manner it is **MANDATORY** to read all additional instruction manuals, if not provided as printed version, see the accompanying CD-ROM for an electronic version (PDF)!

The following additional instruction manuals are available or referenced within this manual:

**HASXEE-IM-HS**     X-STREAM XE series instruction manual

**HASICx-IM-H**     Infallible containment instruction manual

Contact your local service center or sales office when missing documents.

**SAVE ALL INSTRUCTIONS FOR FUTURE USE!**

**Safety Instructions**

**OPERATING AND MAINTAINING THIS UNIT**

On leaving our factory, this instrument conformed to all applicable safety directives.

In order to preserve this state of affairs, the operator must take care to follow all the instructions and notes given in this manual and on the unit.

Before switching on the unit, ensure that the local nominal mains voltage corresponds to the factory-set operational voltage of this unit.

Any interruption of the protective earth connections, whether inside or outside of the unit, may result in exposure to the risk of electricity. Deliberately disconnected the protective earth is therefore strictly forbidden.

Removing covers may expose components conducting electric current. Connectors may also be energised. The unit should therefore be disconnected from the power supply before any kind of maintenance, repair or calibration

work requiring access to the inside of the unit.

Only trained personnel who are aware of the risk involved may work on an open and energized unit.





Fuses may only be replaced by fuses of an identical type and with identical ratings. It is forbidden to use repair fuses or to bypass fuses.





Take note of all applicable regulations when using this unit with an autotransformer or a variable transformer.

Substances hazardous to health may escape from the unit's gas outlet. This may require additional steps to be taken to guarantee the safety of operating staff.

**Safety Instructions**





|  |  |
|--|--|
|                                       |  <b>WARNING</b> |
| <b>EXPLOSION HAZARD</b>  |  |
| <p>The units described in this manual may not be used in explosive atmospheres without additional safety measures.</p> |  |

|   |  |
|---|--|
| <br><br>  |  <b>WARNING</b> |
| <b>ELECTRICAL SHOCK HAZARD</b>  |  |
| <p>Do not operate without covers secure.<br/>             Do not open while energized.<br/>             Installation requires access to live parts which can cause death or serious injury.<br/>             For safety and proper performance this instrument must be connected to a properly grounded three-wire source of power.</p> |  |

|  |  |
|--|--|
| <br>   |  <b>WARNING</b> |
| <b>TOXIC GASES</b>   |  |
| <p>This unit's exhaust may contain toxic gases such as (but not limited to) e.g. sulfur dioxide. These gases can cause serious injuries.<br/>             Avoid inhaling exhaust gases.<br/>             Connect the exhaust pipe to a suitable flue and inspect the pipes regularly for leaks.<br/>             All connections must be airtight to avoid leaks;  X-STREAM XE series instruction manual on how performing a leak test.</p> |  |

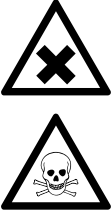





Safety Instructions

|   |  |
|---|--|
|    | <p style="text-align: center;"><b>⚠ CAUTION</b></p> <p style="text-align: center;"><b>HEAVY INSTRUMENT</b></p> <p>The models intended for outside and wall mounted use (X-STREAM XEF and XDF) weigh between 25 kg (57 lb) and 45 kg (99 lb), depending on version and options installed.</p> <p>Two people and/or lifting equipment is required to lift and carry these units.</p> <p>Take care to use anchors and bolts specified to be used for the weight of the units!</p> <p>Take care the wall or stand the unit is intended to be installed at is solid and stable to support the weight!</p> |
|  | <p style="text-align: center;"><b>⚠ CAUTION</b></p> <p style="text-align: center;"><b>CRUSHING HAZARD</b></p> <p>Take care of crushing hazard when closing the front door of analyzer field housings!</p> <p>Keep out of the closing area between enclosure cover and base!</p>  |
|  | <p style="text-align: center;"><b>⚠ CAUTION</b></p> <p style="text-align: center;"><b>OPERATION AT LOW TEMPERATURES</b></p> <p>When operating an instrument at temperatures below 0 °C (32 °F), do NOT apply gas nor operate the internal pump before the warmup time has elapsed!</p> <p>Violation may result in condensation inside the gas paths or damaged pump diaphragm!</p>   |
|  | <p style="text-align: center;"><b>⚠ CAUTION</b></p> <p style="text-align: center;"><b>HIGH TEMPERATURES</b></p> <p>Hot parts may be exposed when working on photometers and/or heated components in the unit.</p>  |

**Safety Instructions**





**GASES AND PREPARATION OF GASES**



|   |  |
|---|--|
|    |  <b>WARNING</b> |
| <p><b>GASES HAZARDOUS TO HEALTH</b></p> <p>Follow the safety precautions for all gases (sample and span gases) and gas cylinders.</p> <p>Before opening the gas lines, they must be purged with air or neutral gas (N<sub>2</sub>) to avoid hazards from escaping toxic, flammable, explosive or hazardous gases.</p> |  |



|  |   |
|--|---|
|   |  <b>WARNING</b> |
| <p><b>FLAMMABLE OR EXPLOSIVE GASES</b></p> <p>When supplying explosive gases or flammable gases with concentrations of more than 25 % of the lower explosion limit, we <b>RECOMMEND</b> implementing one or more additional safety measures:</p> <ul style="list-style-type: none"> <li>• purging the unit with inert gas</li> <li>• stainless steel internal pipes</li> <li>• flame arrestors on gas inlets and outlets</li> <li>• infallible measuring cells.</li> </ul> |   |

Safety Instructions

POWER SUPPLY




|  |  |
|--|--|
| <br><br> |  <b>WARNING</b>   |
|  | <b>CONNECTING UNITS FOR PERMANENT INSTALLATION</b>   |
|  | <p>Only qualified personnel following all applicable and legal regulations may install the unit and connect it to power and signal cables. Failure to comply may invalidate the unit's warranty and cause exposure to the risk of damage, injury or death.</p>   |
|  | <p>This unit may only be installed by qualified personnel familiar with the possible risks.</p> <p>Working on units equipped with screw-type terminals for electrical connections may require the exposure of energized components.</p> <p>Wall-mounted units have no power switch and are operational when connected to a power supply. The operating company is therefore required to have a power switch or circuit breaker (as per IEC 60947-1/-3) available on the premises. This must be installed near the unit, easily accessible to operators and labelled as a power cut-off for the analyzer.</p> |

|   |  |
|---|--|
|    |  <b>CAUTION</b> |
|   | <b>HAZARD FROM WRONG SUPPLY VOLTAGE</b>  |
| <p>Ensure that the local power voltage where the unit is to be installed, corresponds to the unit's nominal voltage as given on the name plate label.</p> |  |

|   |   |
|---|---|
|  |  <b>CAUTION</b>  |
|   | <b>ADDITIONAL NOTES FOR UNITS WITH SCREW-TYPE TERMINALS</b>   |
|   | <p>Cables for external data processing must be double-insulated against mains power.</p> <p>If this is not possible, cables must be laid in such a way as to guarantee a clearance of at least 5 mm from power cables. This clearance must be permanently secured (e.g. with cable ties).</p> |

## General Operating Notes

## GENERAL OPERATING NOTES

|   |   |
|---|---|
|  | <b>WARNING</b>  |
|   | <b>EXPLOSION HAZARD BY EXHAUST GASES</b>  |
|   | <b>Exhaust gases may contain hydrocarbons, other toxic gases or even explosive gases.</b> |
|  | <b>Faulty gas connections may lead to explosion and death.</b>                            |
|  | <b>Ensure that all gas connections are connected as labelled and airtight.</b>            |

- The unit must be installed in a clean and dry area, protected from strong vibrations and frost.
- The unit must not be exposed to direct sunlight and sources of heat. Admissible ambient temperatures (see technical details) must be adhered to.
- Gas inlets and outlets must not be interchanged. All gases must be conditioned, before supplied to the unit. When using this unit with corrosive sample gases, ensure that these gases do not contain components harmful to the gas lines.
- Admissible gas pressure for sample and test gases is 1,500 hPa.
- Exhaust lines must be laid inclined downwards, depressurized, protected from frost and according to applicable regulations.
- If it is necessary to disconnect the gas lines, the unit's gas connectors must be sealed with PVC caps to avoid polluting the internal gas lines with condensate, dust, etc.
- To ensure electromagnetic compatibility (EMC), only shielded cables (supplied by us on request, or of equivalent standard) may be used. The customer must ensure that the shielding is correctly fitted. Shielding and terminal housing must be electrically connected; submin-D plugs and sockets must be screwed to the unit.
- When using optional external adapters (submin-D to screw-type terminals), protection against electromagnetic interference is not ensured (CE compliance pursuant to EMC guidelines). In this case the customer or operating company functions as a system builder and must therefore ensure and declare compliance with EMC guidelines.

## Chapter 1 Technical description

The following are the main features of the new Emerson Process Management X-STREAM XE series gas analyzers in brief:

- compact design with easily accessible internal components
- customizable for a wide range of applications: different housings are available while internal construction remains largely identical
- a highly integrated mainboard contains all interfaces and basic functions for the operation of the unit
- multilingual microprocessor-controlled user interface with liquid crystal (LCD) to indicate measurement value and status messages
- units for outdoor use are optionally supplied with an impact tested front panel
- widerange power supply unit for worldwide use without modification (½ 19in units with external PSUs)

The new X-STREAM XE gas analyzers can measure up to five different gas components using any combination of the following analyzing techniques (restrictions apply to ½ 19in units):

- IR = non-dispersive infrared analysis
- UV = ultraviolet analysis
- pO<sub>2</sub> = paramagnetic oxygen analysis

eO<sub>2</sub> = electrochemical oxygen analysis

TC = thermal conductivity analysis


Modified resistant measuring cells are available for use with corrosive gases and/or gases containing solvents.



Special configurations (e.g. intrinsically safe or infallible measuring cells) for the analysis of combustible gases are also available.

### Standard applications

Different housings allow X-STREAM XE analyzers to be tailored to the many different applications:

- Tabletop units in ½ 19in modular design, with IP 20 protection class
- Tabletop and rackmountable units in 19in modular design, with IP 20 protection class
- Stainless steel wallmountable field housing with IP 66 / NEMA 4X protection class for outdoor use (operating temperature 0 (-20) °C to +50°C).
- Cast aluminium wallmountable field housing with IP 66 / NEMA 4X protection class for outdoor use (operating temperature 0 (-20) °C to +50 °C).

The various analyzer types are described in more detail beginning with  1-3.

|   |  |
|---|--|
|  |  <b>WARNING</b>   |
|   | <b>EXPLOSION HAZARD</b><br><b>X-STREAM XE analyzers CAN NOT be used in explosive environments (hazardous areas) without additional safety features.</b><br><b>This instruction manual does NOT describe the special conditions necessary to operate gas analyzers in hazardous areas.</b><br><b>Please refer to the separate instruction manual, supplied with units for use in hazardous areas.</b> |

## 1.1 Overview

### 1.1 Overview


All X-STREAM gas analyzers feature an easy-to-use graphical user interface, which displays measurement values, status and error messages, and menus for the input of parameters.

For ease of use, the operator can select one of three languages for the display: By default any analyzer is configured with English and

German language sets, while a third can optionally be added. Currently available: French, Italian, Portuguese and Spanish..

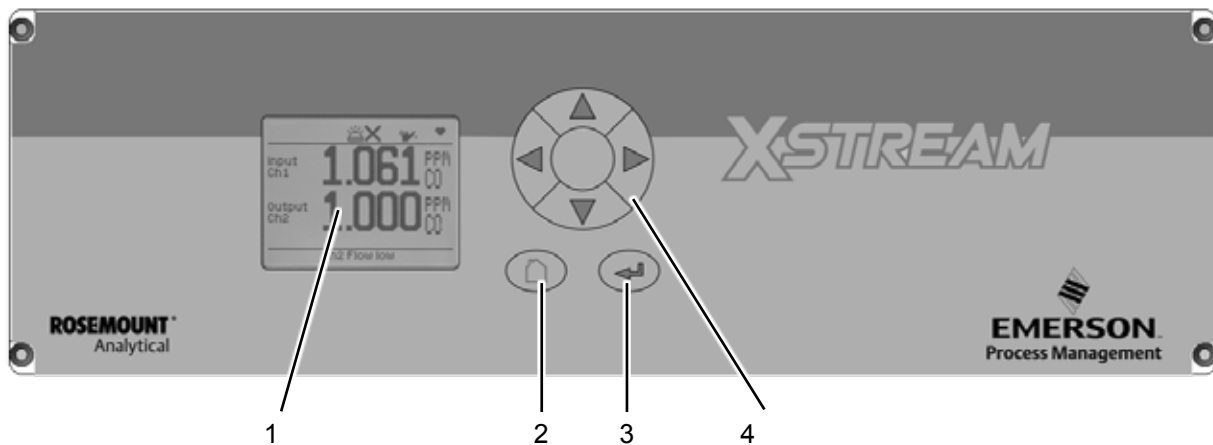
#### 1.1.1 The Front Panel

The graphic LCD shows measurement and status information with plain text and symbols.

The symbols are designed to indicate the different status “Failure”, “Function check”, “Out of specification” and “Maintenance request” as specified by the NE 107 standard. For further information,  X-STREAM XE instruction manual.

The analyzer software is operated by means of only six keys.

Depending on the analyzer model, the display can also be protected with an impact tested glass panel, to withstand even harsher conditions and to provide a higher IP protection class of up to IP66 / NEMA Type 4X.



- 1 Graphic display
- 2 “Measure“ key
- 3 “Enter“ key
- 4 4 keys for settings and menu navigation

**Fig. 1-1:** X-STREAM front panel (here the X-STREAM XEGP)

## 1.2 Comparison of Analyzer Models

### 1.2 Comparison of the Various X-STREAM Analyzer Model

X-STREAM XEGC



X-STREAM XEGP



|   |
|---|
| ½ 19 in housing, table-top or rackmountable, protection type: IP 20   |
| 24V input with external power supply unit   |
| Max. 3 channels: 2 photometer + 1 WLD/O <sub>2</sub><br>max. 6 gas connections,<br><i>including 1 optional purge gas connection</i>   |
| <i>Options for gas lines: Flow sensor, pressure sensor, infallible gas lines</i>  |
| 1-4 analog outputs, 4 relay outputs, 2 Modbus Ethernet interfaces, 2 USB connectors<br><i>optional:</i><br>1 interface card with 7 digital inputs and 9 digital outputs<br>1 interface card with analog inputs<br>electrical interfaces accessible via sockets on back of unit, <i>optionally: screw-type terminal adapters (except for Ethernet &amp; USB)</i> |
| LCD   |
| Operating ambient temperature:<br>0 °C to +50 °C (32 °F to 122 °F)  |
|   |
| Size: (DxHxW): max. ca. 440x130x220 mm<br>Weight: ca. 8 - 12 kg (17.6 - 26.5 lb)  |

|   |
|---|
| ¼ 19 in housing, table-top or rackmountable, protection type: IP 20   |
| Internal wide range power supply unit   |
| Max. 4 channels in any combination<br>max. 8 gas connections,<br><i>1 optional extra connection for purge gas</i>   |
| <i>Options for gas lines: Flow sensor, pressure sensor, heating for physical components, sample gas pump, 1 or 2 valve blocks, infallible gas lines</i>   |
| 1-4 analog outputs, 4 relay outputs, 2 Modbus Ethernet interfaces, 2 USB connectors<br><i>optional:</i><br>1 or 2 interface cards, each with 7 digital inputs and 9 digital outputs<br>1 interface card with analog inputs<br>electrical interfaces accessible via sockets on back of unit, <i>optionally: screw-type terminal adapters (except for Ethernet &amp; USB)</i> |
| LCD   |
| Operating ambient temperature:<br>0 °C to +50 °C (32 °F to 122 °F)  |
|   |
| Size: (DxHxW): max. ca. 411x133x482 mm<br>Weight: ca. 11 - 16 kg (24.3 - 35.3 lb)   |

1.2 Comparison of Analyzer Models

X-STREAM XEF / XDF



X-STREAM XEFD



|  |
|--|
| Stainless steel wallmountable field housing, protection type: IP66 / NEMA 4X<br>Single or dual compartment design  |
| Internal wide range power supply unit  |
| Max. 4 channels in any combination<br>max. 8 gas connections,<br><i>1 optional extra connection for purge gas</i>  |
| <i>Options for gas lines: Flow sensor, pressure sensor, heating for physical components, sample gas pump, 1 or 2 valve blocks, infallible gas lines</i>  |
| 1-4 analog outputs, 4 relay outputs, 2 Modbus Ethernet interfaces, 2 USB connectors<br><i>optional:</i><br><i>1 or 2 interface cards, each with 7 digital inputs and 9 digital outputs</i><br><i>1 interface card with analog inputs</i><br>electrical interfaces on internal screw-type terminal adapters (except for Ethernet & USB) |
| LCD, impact tested front panel   |
| Operating ambient temperature:<br>-20 °C to +50 °C (-4 °F to 122 °F)   |
| Models available for use in explosive environments   |
| Size: (DxHxW): ca. 265x400 (815)x550 mm<br>Weight: max. ca. 25 (45) kg / 55.1 (99.2) lb  |

|  |
|--|
| Cast aluminium wallmountable field housing, protection type: IP66 / NEMA 4X  |
| Internal wide range power supply unit  |
| Max. 4 channels in any combination<br>max. 8 gas connections,<br><i>including 2 optional purge gas connection</i>  |
| <i>Options for gas lines: Flow sensor, pressure sensor, heating for physical components, sample gas pump, 1 or 2 valve blocks, infallible gas lines</i>  |
| 1-4 analog outputs, 4 relay outputs, 2 Modbus Ethernet interfaces, 2 USB connectors<br><i>optional:</i><br><i>1 or 2 interface cards, each with 7 digital inputs and 9 digital outputs</i><br><i>1 interface card with analog inputs</i><br>electrical interfaces on internal screw-type terminal adapters (except for Ethernet & USB) |
| LCD, impact tested front panel   |
| Operating ambient temperature:<br>-20 °C to +50 °C (-4 °F to 122 °F)   |
| Flameproof enclosure: approved for use in explosive environments   |
| Size: (DxHxW): max. ca. 222x512x578 mm<br>Weight: max. ca. 63 kg (138.9 lb)  |
| <b>This model is not covered by this manual!<br/>See the separate X-STREAM Ex d manual for hazardous area applications!</b>  |



1.3 X-STREAM XEGC

1.3 X-STREAM XEGC: 1/2 19 Inch Table-Top Unit

This compact model for general purposes can be fitted with up to three photometer measurement channels (IR or UV) and one additional non-photometer channel (eO<sub>2</sub>, pO<sub>2</sub> or WLD). Power is supplied by a separate external power supply unit.

By default the units are configured for tabletop use. For rack mounting an accessory kit can be ordered to either install 2 units alongside, or one single unit together with a blind plate.

Connection to power supply

DC 24 V power is supplied via a 3-pin socket at the rear of the unit.

Interfaces

Electrical connections for interface signals are provided via submin-D connectors, Ethernet and USB connectors mounted on the rear panel of the device (fig. 1-5).

For applications where screw-type terminals are preferred, optional adapters are available, which are mounted directly onto the submin-D connectors.

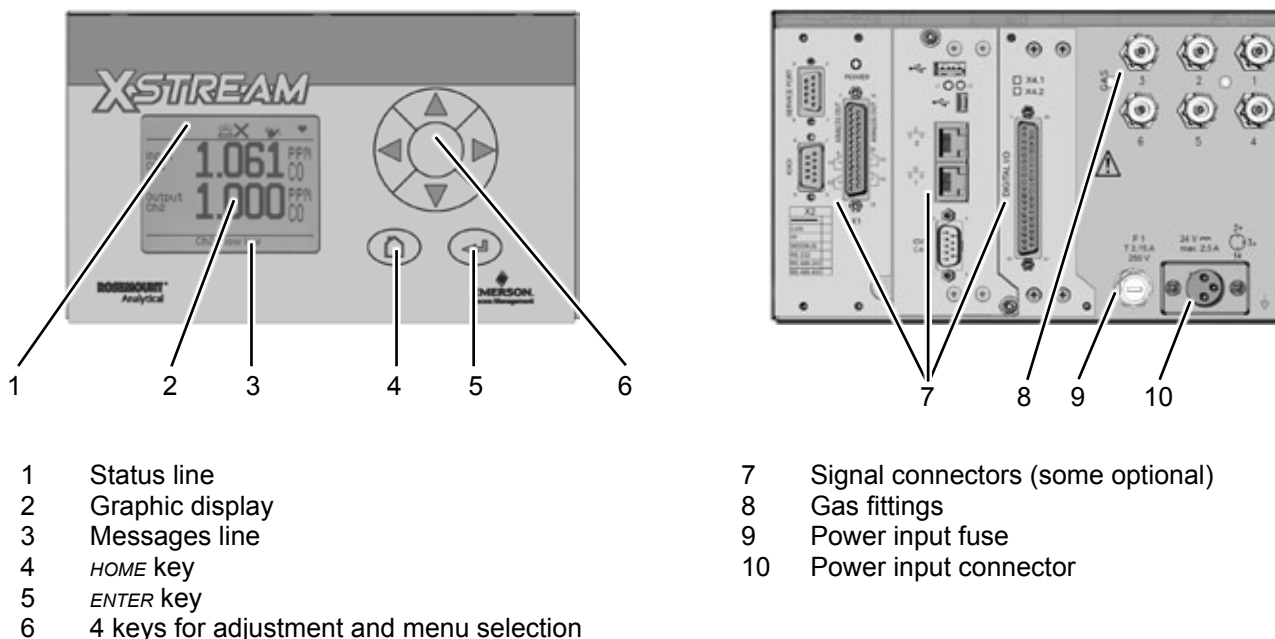


Fig. 1-2: X-STREAM XEGC

## 1.4 X-STREAM XEGP

### 1.4 X-STREAM XEGP: 19 Inch Table-Top Or Rackmount Design

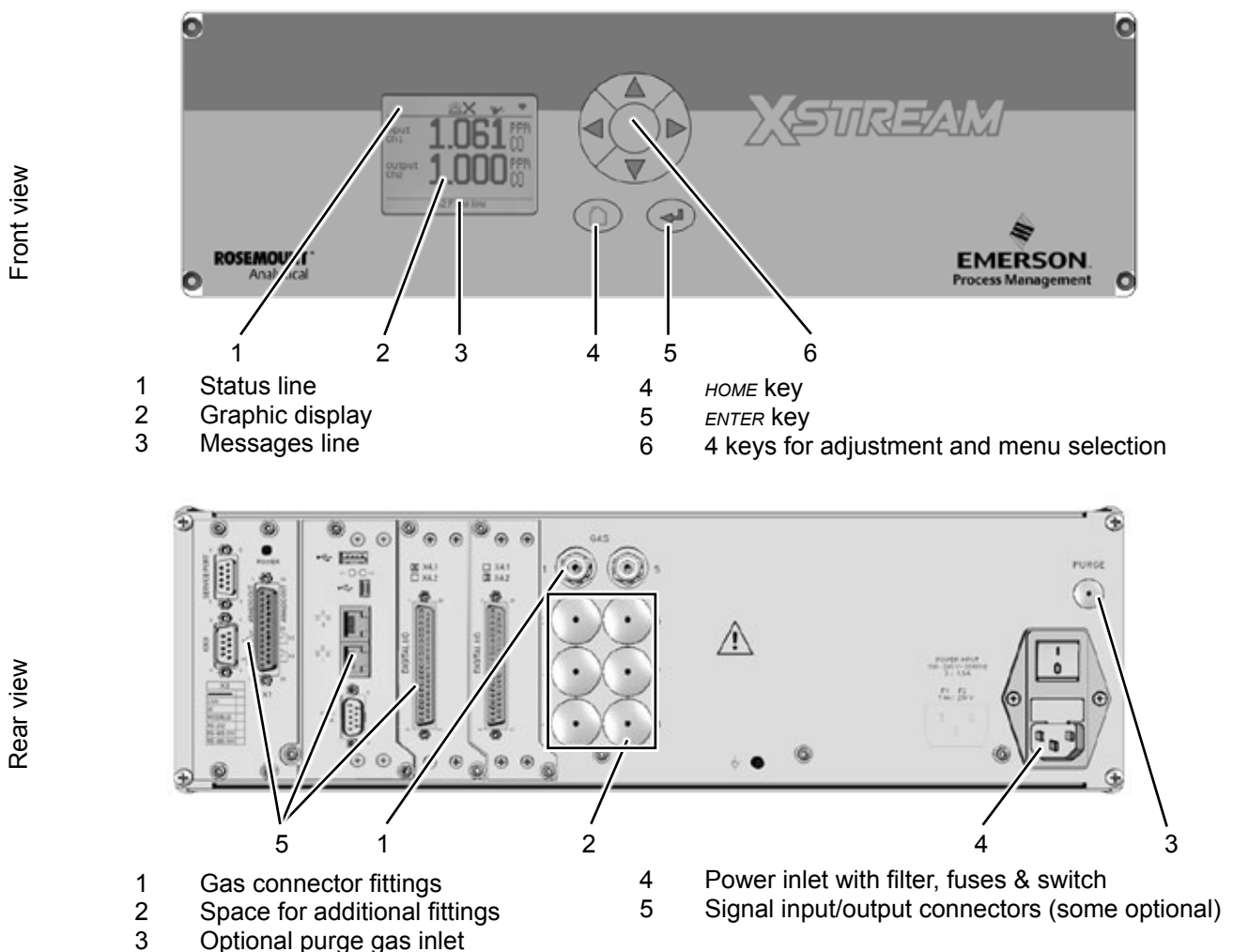
This model can be fitted with up to four measurement channels in any combination. The physical components can optionally be encased in a cover. This area can be held at a specific temperature of up to 60 °C to minimize interference from changes in external temperature.

Units configured for rack mounting can be converted for tabletop use by removing the lateral mounting brackets and attaching the four feet supplied as accessories.

#### Connection to power supply

Main power is supplied via the IEC chassis plug mounted on the rear panel, with integrated power switch and fuse holders. The internal wide range power supply unit enables the analyzers to be used worldwide.

Adaptors are optionally available for signal connections, to provide screw terminals instead of submin-d-connectors (1-7).



**Fig. 1-3:** X-STREAM XEGP

1.4 X-STREAM XEGP

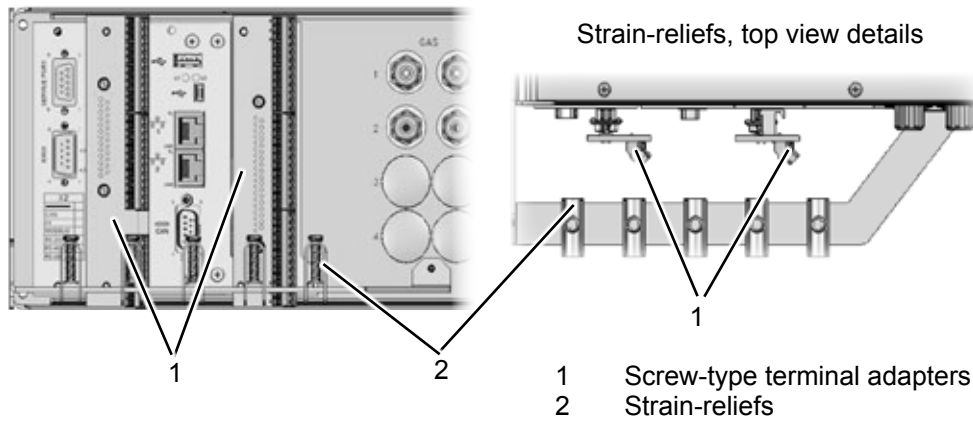


Fig. 1-4: Optional screw-type terminal adapters

## 1.5 X-STREAM XE Field Housing

### 1.5 X-STREAM XEF/XDF: Field Housing With Single Or Dual Compartment

The field housing model is conceived for outdoor use and wall-mounting. The coated stainless steel housing has a protection class rated IP66 / NEMA Type 4X, offering protection against water and dust entering the device:

*IPx6: Water projected in powerful jets against the enclosure from any directions shall have no harmful effects*

*IP6x: Protection against penetration by dust. Live or internal moving parts are completely protected.*

X-STREAM field housings can be fitted with up to four measurement channels in any combination. The physical components can optionally be encased in a cover. This separate

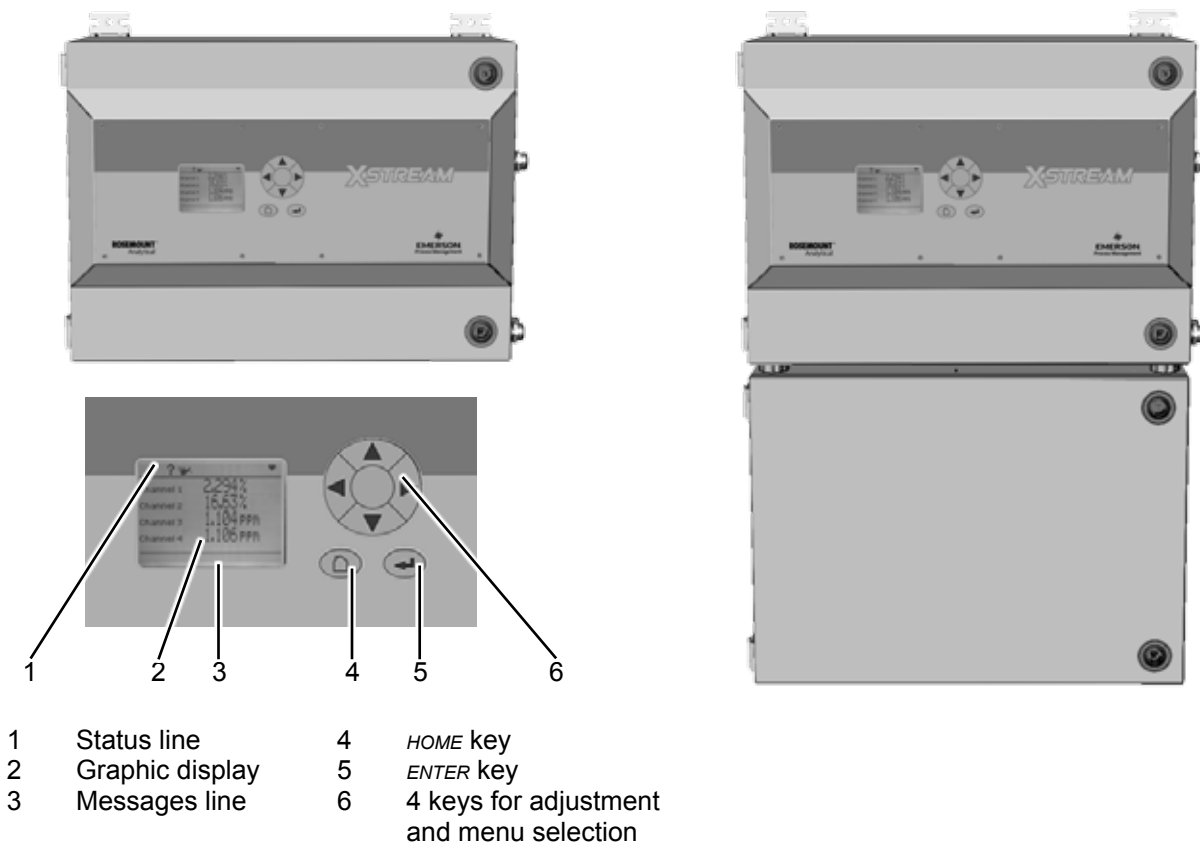
volume can be held at a specific temperature of up to 60 °C to minimize interference from changes in external temperature.

#### Front panel

The analyzer's display can optionally be protected by an impact tested glass for enhanced protection against breakage in harsh environments.

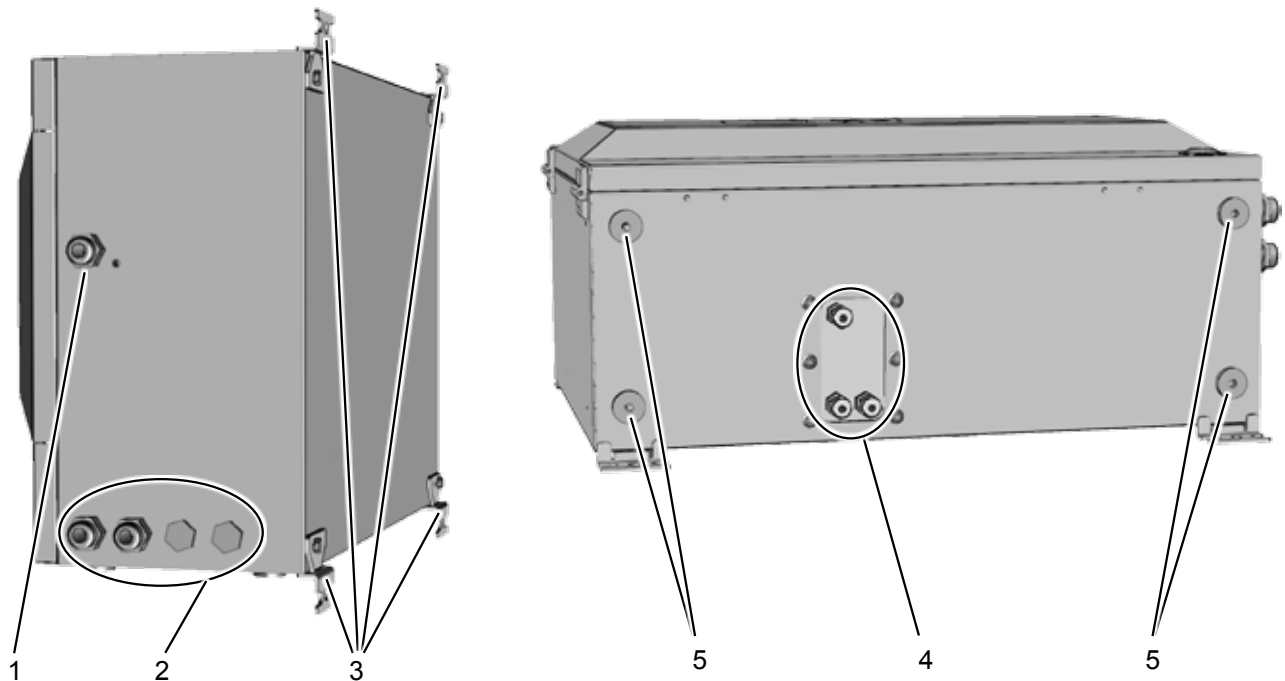
#### Connection to power supply

Mains power is supplied via screw-type terminals with integrated fuse holders at the right of the housing, near the front. The wide range power supply unit mounted internally enables the analyzers to be used worldwide.



**Fig. 1-5:** X-STREAM XEF / XDF- Front views

1.5 X-STREAM XE Field Housing




- 1 Cable gland for power cable
- 2 Cable glands for signal cables
- 3 4 brackets for wall-mounting
- 4 Gas in- & outlets (max. 8)
- 5 Cutouts, to combine 2 housings (here closed)

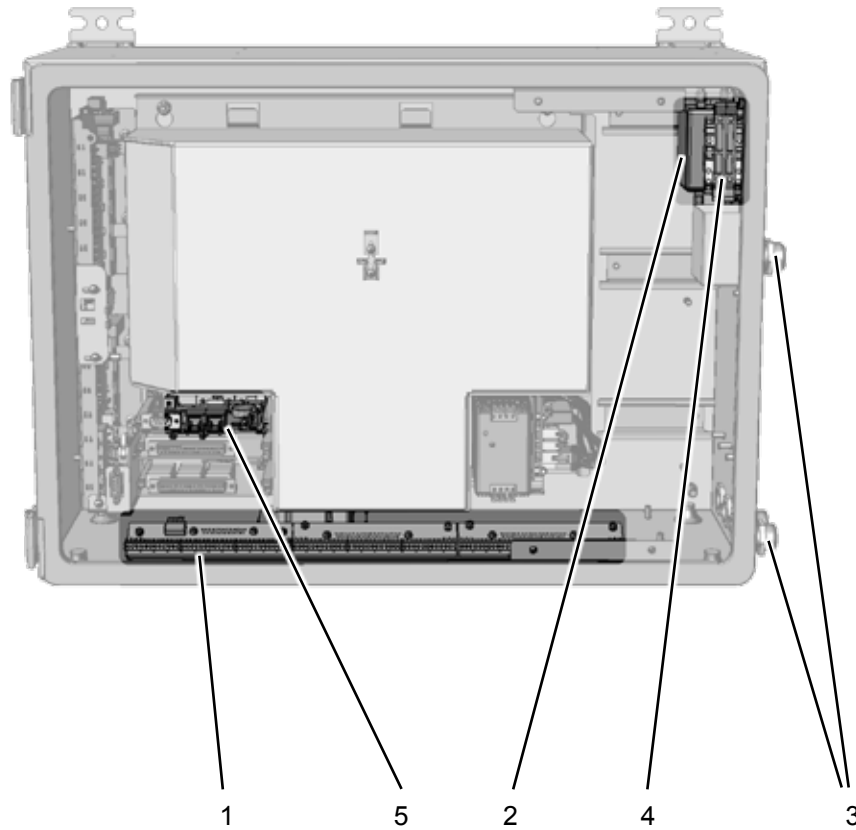
**Note!**

*In case of XDF, the cable glands are located at the upper compartment, while the gas in- & outlets are at the bottom side of the lower compartment.  
 Also only 2 brackets are at each compartment.*

Fig. 1-6: X-STREAM XEF - right side and bottom view

|   |   |
|---|---|
|  | <p><b>! CAUTION</b></p>   |
|   | <p><b>HEAVY INSTRUMENT</b></p> <p>The X-STREAM field housing, intended for outside and wall mounted use, weighs approx. 26 kg/57 lb (XEF) or 45 kg/99 lb (XDF), depending on options installed.</p> <p>Two people and/or lifting equipment is required to lift and carry these units.</p> <p>Take care to use anchors and bolts specified to be used for the weight of the units!</p> <p>Take care the wall or stand the unit is intended to be installed at is solid and stable to support the weight!</p> |

## 1.7 X-STREAM XE Field Housing



(shown with front panel removed)

- 1 Screw-type terminals for signal cables
- 2 Power line filter
- 3 Cable glands
- 4 Power supply terminals with integrated fuses
- 5 Ethernet and USB connectors



**Note!**

*In case of XDF, the terminals and connectors are located at the upper compartment, while physical components and gas fittings are in the lower compartment.*

**Fig. 1-7:** X-STREAM XEF - power supply and signal terminals

1.7 Field Housings in Hazardous Areas

1.5.1 Field Housings for Installation in Hazardous Areas (Ex-Zones)

|   |  |
|---|--|
|  |  <b>WARNING</b>   |
|   | <b>EXPLOSION HAZARD</b><br><b>X-STREAM XEF and XDF models MUST NOT be used in explosive environments (hazardous areas) without additional safety features.</b><br><b>This instruction manual does NOT describe the special conditions necessary to operate gas analyzers in hazardous areas.</b><br><b>Please refer to the separate instruction manual supplied with units for use in hazardous areas.</b> |

Special X-STREAM field housing analyzer variations can be used in Ex-zones 1, 2 or Div 2:

**X-STREAM XEFN/XDFN:**

These analyzer variations feature a protection concept called "non-incendive", which means that non-sparking and non-arcing components, installed within a protecting enclosure, enable installation in an European Ex-zone 2 for measuring non-flammable gases. No further measures, such as a supply of protective gas, are necessary.

**X-STREAM XEFS/XDFS:**

Equipped with a simplified pressurization system, these field housings can be used to measure non-flammable gases in European Ex-zone 2. A protective gas (e.g. pressurized air) must be supplied when operating this model.

**X-STREAM XEFZ/XDFZ:**

Equipped with a simplified pressurization system, these models can be used to measure non-flammable gases in American zone Div 2. A protective gas (e.g. pressurized air) must be supplied when operating this model.

Please contact your local EMERSON Process Management office if you require analyzers for use in hazardous areas.

---

## 1 Technical Description



## Chapter 2 Installation

This chapter describes the correct installation procedure for the various X-STREAM analyzer versions.


**On receipt, check the packaging and its contents thoroughly for damage.**

**Inform the carrier immediately of any damage to packaging or contents, and keep damaged parts until clarification.**

**Store the instrument at a dry and clean place, considering the acceptable environmental conditions.**

**We recommend to keep the packaging available for future transportation, because only the original packaging ensures proper protection!**

### 2.1 Scope of Supply

|   |   |
|---|---|
|  | <b>! WARNING</b>  |
|   | <b>HAZARDS FROM MISSING INFORMATION</b><br>Compare the content of your package with the pictures below.<br>Analyzers for hazardous areas need additional parts, described in the accompanying documentation referring to hazardous area installations.<br>Call your local sales office if something is missing, and <b>DO NOT</b> continue to install your analyzer, until all parts are at hand! |



Analyzer





Manuals, some of which either as paper or CD-ROM version:



- this short form manual
- X-STREAM XE series manual
- infallible containment instruction manual (if applicable to your instrument)

**Fig. 2-1:** X-STREAM XE Analyzers - scope of supply

2.2 Installation - Introduction

2.2 Introduction

|   |  |
|---|--|
|  | <div style="background-color: #ff8c00; padding: 5px; font-weight: bold; font-size: 1.2em;">  <b>WARNING</b> </div> <p style="font-weight: bold; margin-top: 5px;">ELECTRICAL SHOCK HAZARD</p> <p>Before connecting the analyzer to mains power, please read the chapter on safety warnings and the following instructions carefully.</p> <p><b>Disregarding may cause death, personnel injury or damage to equipment!</b></p> |
|---|--|

|   |  |
|---|--|
|  | <div style="text-align: center; margin-bottom: 10px;">  </div> <p>The place of installation must be clean, dry and protected against strong vibrations and frost. Please observe the admissible operating temperatures given in the technical data section.</p> <p>Units must not be subjected to direct sunlight or sources of heat.</p> <p>For outdoor installation it is recommended to install the unit in a cabinet. It should at least be protected against rainfall.</p> |
|---|--|

In order to comply with regulations on electromagnetic compatibility, it is recommended to use only shielded cables which can be supplied by Emerson Process Management. The customer must ensure that the shielding is correctly connected to the signal cable plug housing. Submin-d plugs and sockets must be screwed to the analyzer.



The use of external submin-d to screw-type terminal adapters affects electromagnetic compatibility. In such a case the customer must take appropriate measures to comply with the regulations, and must declare conformity when this is legally required (e.g. European EMC guidelines).

**2.3 Installation - Technical Data**

**2.3 Technical Data**

Before intending to start to install the analyzer, verify the site of installation meets the specifications, given in the following sections!

**2.3.1 Common Technical Data**

|   |   |
|---|---|
| <b>Site of installation</b>   |   |
| Humidity<br>(non-condensing)  | < 90 % RH at +20 °C (68 °F)<br>< 70 % RH at +40 °C (104 °F)   |
| Degree of pollution   | 2   |
| Installation category   | II  |
| Elevation   | 0 to 2000 m (6560 ft) above sea level   |
| Ambient atmosphere  | Units may not be operated in corrosive, flammable or explosive environments without additional safety measures. |
| <b>Certification</b>  |   |
| <b>Electrical safety</b>  |   |
| CAN / USA  | CSA-C/US, based on CAN/CSA-C22.2 No. 61010-1-04 / UL 61010-1, 2nd edition                                       |
| Europe     | CE, based on EN 61010-1   |
| <b>Electromagnetic compatibility</b>  |   |
| Europe  | CE, based on EN 61326   |
| Australia   | C-Tick  |
| others  | NAMUR   |

## 2.3 Installation - Technical Data

### 2.3.2 Specific Technical Data

|                                       | <b>XEGC</b>   | <b>XEGP</b>  | <b>XEF, XDF</b>   |
|---------------------------------------|---|--|---|
| <b>Temperatures</b>                   |   |  |   |
| operational                           | 0 ... +50 °C<br>32 ... 122 °F   | 0 ... +50 °C<br>32 ... 122 °F  | 0 (-20) ... +50 °C<br>32 (-4) ... 122 °F                                  |
| storage                               | -20 ... +70 °C<br>-4 ... -158 °F  | -20 ... +70 °C<br>-4 ... -158 °F   | -20 ... +70 °C<br>-4 ... 158 °F   |
| <b>Weight, max</b>                    | 8 ... 12 kg<br>17.6 ... 26.5 lb   | 12 ... 16 kg<br>26.5 ... 35.3 lb   | XEF: 25 kg / 55.1 lb<br>XDF: 45 kg / 99.2 lb                              |
| <b>IP or Type rating</b>              | IP 20<br>indoor use,<br>protected against<br>dripping water and<br>direct sun light | IP 20<br>indoor use ,<br>protected against<br>dripping water and<br>direct sun light | IP 66 / Type 4X<br>outdoor use ,<br>protected against<br>direct sun light |
| <b>Gas connections</b>                |   |  |   |
| max number                            | 6   | 8  | 8   |
| max for purging<br>(incl. / separate) | 2 incl.   | 1 separate, 1 incl.  | 1 separate, 1 incl.   |
| material                              | PVDF; stainless<br>steel (opt.)   | PVDF; stainless<br>steel (opt.)  | stainless steel   |
| sizes                                 | 6/4 mm; ¼"  | 6/4 mm; ¼"   | 6/4 mm; ¼"  |
| <b>Power supply unit</b>              | wide range,<br>external   | wide range,<br>internal  | wide range,<br>internal   |
| <b>Power supply</b>                   |   |  |   |
| nominal voltage                       | DC 24 V   | 100 - 240 V~<br>50 / 60 Hz   | 100 - 240 V~<br>50 / 60 Hz  |
| voltage range                         | DC 10 ... 30 V  | 85 - 264 V~<br>47 - 63 Hz  | 85 - 264 V~<br>47 - 63 Hz   |
| nominal input current                 |   |  |   |
| standard, max                         | 2.5 A   | 1.3 - 0.7 A  | XEF: 1.3 - 0.7 A<br>XDF: 1.5 - 0.8 A                                      |
| w/ temperature control, max           | n.a.  | 3 - 1.5 A  | XEF: 3 - 1.5 A<br>XDF: 5.5 - 3 A  |
| <b>Power input fuses</b>              | AC 230 V<br>T 3.15 A<br>5x20 mm   | AC 230 V<br>T 4 A<br>5x20 mm   | AC 230 V<br>T 6.3 A<br>5x20 mm  |

2.4 Installation - Gas Conditioning

2.4 Gas Conditioning

In order to ensure trouble-free operation, special attention must be paid to the preparation of the gases:



**All gases must be conditioned before supplying to the analyzer, to be**

- **dry,**
- **free of dust and**
- **free of any aggressive components which may damage the gas lines (e.g. by corrosion or solvents) .**



**Flammable gases must not be supplied without additional protective measures.**

If moisture cannot be avoided, it is necessary to ensure that the dew point of the gases is at least 10 °C (18 °F) below the ambient temperature to avoid condensate in the gas lines.

The X-STREAM field housings can optionally be fitted with heated piping to enable the use of gases with a maximum dew point of 25 °C (77 °F).

See the X-STREAM XE instruction manual, chapter 3 for more information.

| Summary of the Most Important Gas Parameters |  |  |  |
|--|--|--|--|
|  | NDIR/UV/VIS                              | Oxygen Sensor (PO2 and EO2)                                  | Thermal Conductivity                     |
| Permissible gas flow                         | 0.2 - 1.5 l/min.                         | 0.2 - 1.0 l/min <sup>1</sup> / 0.2 - 1.5 l/min. <sup>2</sup> | 0.2 - 1.0 l/min. (± 0.1 l/min)           |
| Maximum gas pressure <sup>9</sup>            | ≤ 1,500 hPa abs. (< 7 psig) <sup>3</sup> | ≤ 1,500 hPa abs. (< 7 psig) <sup>4,3</sup>                   | ≤ 1,500 hPa abs. (< 7 psig) <sup>3</sup> |
| Permissible ambient temperature              | 0 to +50 °C (32 to 122 °F)               | 0 to +50 °C (32 to 122 °F) <sup>2</sup>                      | 0 to +50 °C (32 to 122 °F)               |
| Thermostat control <sup>6</sup>              | Optionally 60 °C (140 °F) <sup>5</sup>   | 60 °C (140 °F) <sup>1</sup> / None <sup>2</sup>              | 75 °C (167 °F) <sup>8</sup>              |
| Warm-up time                                 | 15 to 50 minutes <sup>5,7</sup>          | approx.. 50 minutes <sup>1</sup>                             | 15 to 50 minutes <sup>7</sup>            |

<sup>1</sup> Paramagnetic oxygen measurement (PO2)      <sup>4</sup> No sudden pressure surge for PO2 allowed      <sup>7</sup> Depending on measuring range  
<sup>2</sup> Electrochemical oxygen measurement (EO2)      <sup>5</sup> Dependent on integrated photometer bench      <sup>8</sup> Sensor / cell only  
<sup>3</sup> Special conditions apply to model XEFD      <sup>6</sup> Optional thermostatically controlled box: 60 °C      <sup>9</sup> with internal sample gas pump: atmospheric

**Purging option**



The purging medium (e.g. to minimize CO<sub>2</sub> interference or for enhanced safety when measuring corrosive or poisonous gases) **must be dry, clean and free of corrosives or components containing solvents.**



**To minimize cross interferences the purge gas also has to be free of components to be measured.**

**Its temperature must correspond to the ambient temperature of the analyzer, but be at least within the range 20–35 °C (68–95 °F).**

For information about values for pressure and flow, please contact your nearest EMERSON Process Management sales office.

2.4 Installation - Gas Conditioning

|   |  |
|---|--|
|  |  <b>WARNING</b>   |
|   | <b>TOXIC GAS HAZARDS</b>   |
|   | <p>Take care that all external gas pipes are connected in the described way and that they are gastight to avoid leakages!</p>  |
|   | <p>Faulty connected gas pipes lead to explosion hazard or even to mortal danger!</p> <p>Don't take a breathe of the emissions! Emissions may contain hydrocarbons or other toxic components (e.g. carbon monoxide)! Carbon monoxide may cause headache, sickness, unconsciousness and death.</p> |

|   |   |
|---|---|
|  |  <b>CAUTION</b>  |
|   | <p>Do not confuse gas inlets and outlets. All gases supplied must be prepared beforehand. When supplying aggressive gases, ensure that the gas lines are not damaged.</p> |
|   | <p>Max. admissable pressure: 1500 hPa / 7 psig!</p>   |
|   | <p>Exhaust lines must be installed to incline downwards and be unpressurized and protected against frost, and conform to legal requirements.</p>                          |

The number of gas connections and their configuration may vary according to analyzer version and installed options.

All gas connectors are labelled and can be found on the

- analyzer's rear panel (X-STREAM XEGP, X-STREAM XEGC)
- underside of the analyzer (X-STREAM field housings)

Should it be necessary to open the gas lines, the gas connectors should be sealed with PVC caps to prevent pollution by moisture, dust, etc.

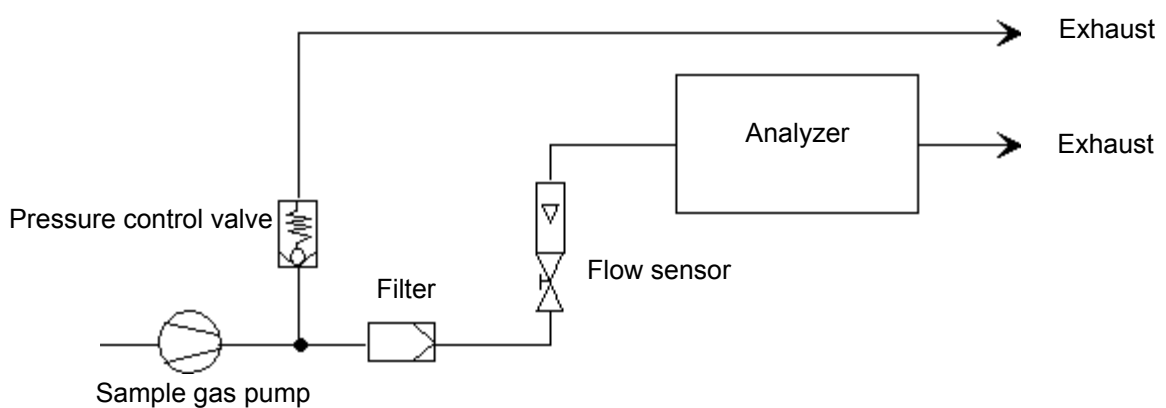
|   | IN     | OUT       |
|---|--------|-----------|
| 1 | SAMPLE | SAMPLE    |
| 2 |        |           |
| 3 |        |           |
| 4 |        | PURGE GAS |

Fig. 2-2: Labelling of gas connectors (example)

**2.4 Installation - Gas Conditioning**

The analyzer should be mounted close to the sample gas source to minimize transport time. A sample gas pump can be used to reduce the reaction time; this requires that the analyzer be operated in bypass mode or fitted with a





pressure control valve to protect against excessive gas flow and pressure (fig. 1-2).



**Fig. 2-3:** Installation in bypass mode

## 2.5 Installation - Electrical Connections

### 2.5 Electrical Connections

|  |  |
|--|--|
| <br><br><br><br>  | <p style="text-align: center;"> <b>WARNING</b></p>  |
|  | <p style="text-align: center;"><b>ELECTRICAL SHOCK HAZARD BY INSTALLATION</b></p>  |
|  | <p>Only qualified personnel, observing all applicable technical and legal requirements, may install these devices and connect power and signal cables.</p>   |
|  | <p>Failure to comply may render the guarantee void and cause exposure to risk of damage, injury or death.</p>  |
|  | <p>The devices may only be installed by personnel who are aware of the possible risks. Working on units with screw-type terminals for electrical connections may require exposure to energized components.</p> |
| <p>Wall-mountable X-STREAM analyzers are not fitted with power switches and are operational as soon as they are connected to a power supply. A switch or circuit breaker (IEC 60947-1/-3) must be installed on the premises. The switch or breaker must be located near the analyzer, easily accessible and labelled as a power supply cut-off for the analyzer.</p> |  |
| <p>Units with screw-type terminals must be de-energized by unplugging it or operating the separate cut-off switch or circuit breaker, when working on the power connections.</p>   |  |
| <p>To avoid the risk of electrical shock, all units must be earthed. For this reason, a power cable with protective earth conductor must be used.</p>  |  |
| <p>Any break in the earth wire inside or outside the unit may cause exposure to the risk of electrocution and is therefore prohibited.</p>   |  |






2.6 Detailed Instructions for Installation

2.6 Detailed Instructions for Installation

**Important note for X-STREAM XEFD!**

Due to the special conditions which must be observed when installing units in EX zones, the installation of the flameproof **X-STREAM XEFD** version is described in a separate **instruction manual HASXEDE-IM-EX**.

Even if you do not install your X-STREAM XEFD in an EX zone, please install the unit according to the instructions in the separate manual.

|  |                            |   |           |
|--|----------------------------|---|-----------|
| Installation instructions:                 | X-STREAM XEGC & XEGP       |  | page 2-10 |
|  | X-STREAM XE field housings |  | page 2-18 |
| Notes for wiring signal inputs and outputs |                            |  | page 2-30 |

# X-STREAM XE

## 2.6.1 Installation - X-STREAM XEGC, X-STREAM XEGP

### 2.6.1 X-STREAM XEGC, X-STREAM XEGP

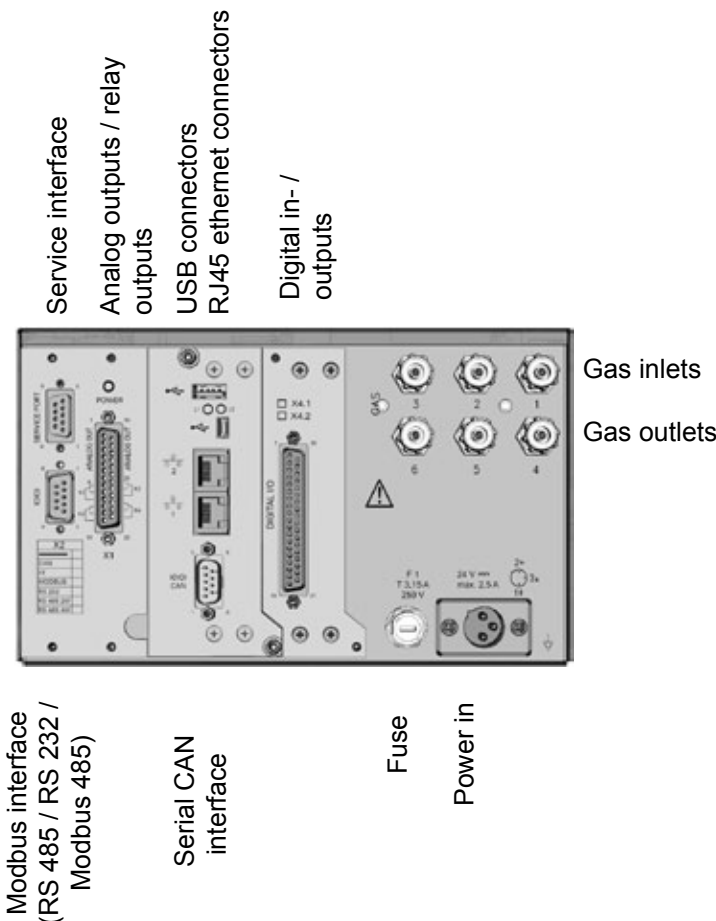
Plugs and sockets required for the electrical connections are on the rear panel of the units (fig. 2-4 & 2-5).

X-STREAM XEGC analyzers are powered by an external 24 V power supply unit which can be supplied with the unit as an option. If the PSU is not included in delivery, another unit can be used instead, provided it conforms to the specifications given in the X-STREAM XE instruction manual.

X-STREAM XEGP analyzers provide an internal widerange power supply for worldwide use.

X-STREAM XEGC / XEGP analyzers should be operated in a horizontal position.

The optional brackets enable the units to be mounted in a rack; this is accomplished by means of four screws (fig. 2-5 & 2-6).



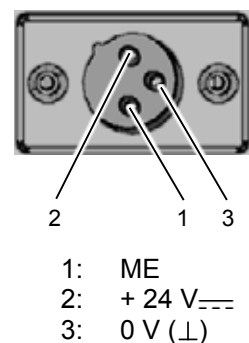
**! CAUTION**

**HAZARD BY INSTALLATION**

**The brackets are not designed to carry the weight of the instrument!**

**Support the instrument, when rack mounting!**

**Disregarding may cause personal injury and damaged equipment.**



- 1: ME
- 2: + 24 V<sub>DC</sub>
- 3: 0 V (⊥)

Fig. 2-4: X-STREAM XEGC - rear panel

2.6.1 Installation - X-STREAM XEGC, X-STREAM XEGP

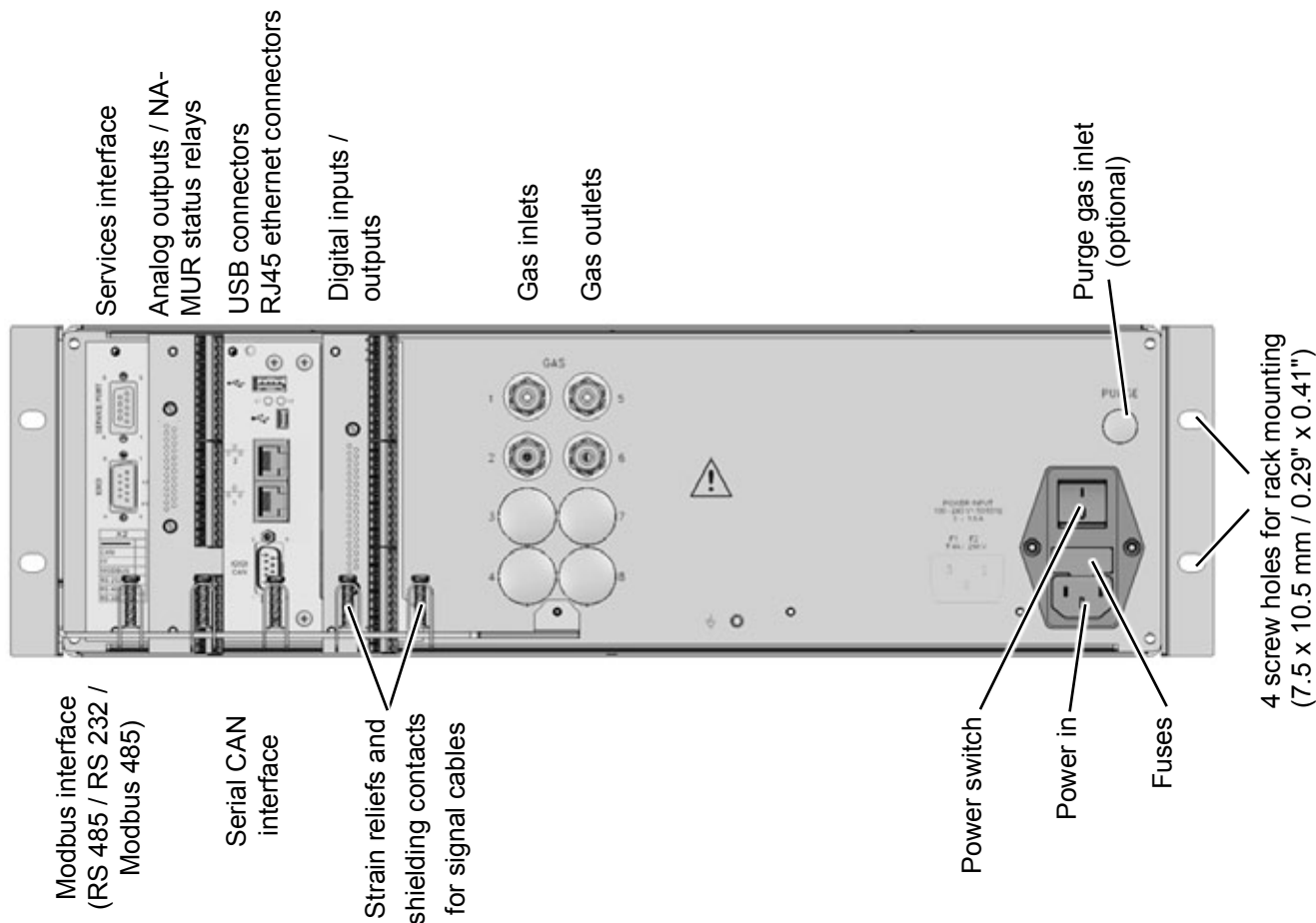


Fig. 2-5: X-STREAM XEGP - rear panel, shown with optional terminal adapters and front side brackets for rack mounting

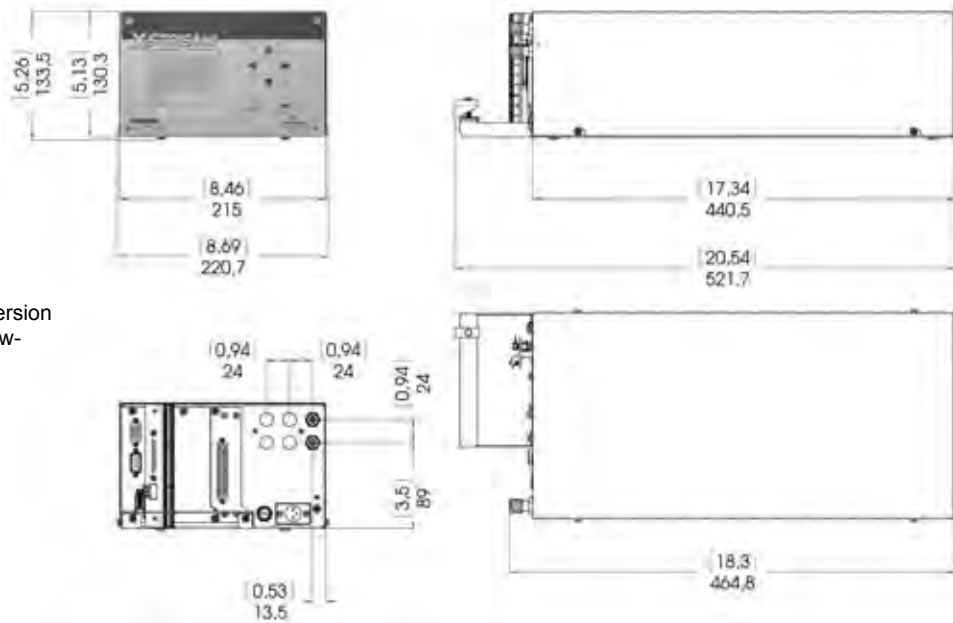
The number and configuration of the gas inlets and outlets vary from model to model and are indicated on the notice on the rear of the instrument.

To simplify installation, we recommend labelling the gas lines as in the figures above (1, 2, 3, ...). This avoids confusion in case the analyzer ever has to be disconnected.

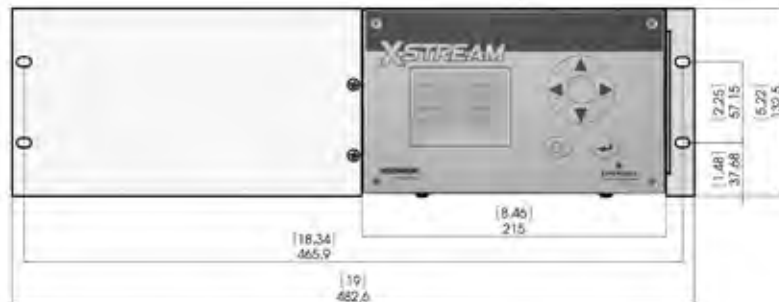
|                                    | X2GC                         | X2GP                 |
|------------------------------------|------------------------------|----------------------|
| Gas connections                    |                              |                      |
| max number                         | 6                            | 8                    |
| max for purging (incl. / separate) | 2 incl.                      | 1 incl. & 1 separate |
| material                           | PVDF; stainless steel (opt.) |                      |
| sizes                              | 6/4 mm; 1/4"                 |                      |

## 2.6.1 Installation - X-STREAM XEGC, X-STREAM XEGP

Drawings show tabletop version with strain-reliefs and screw-type terminals.



Analyzer with blindplate to the left



Analyzer with blindplate to the right



Two analyzers in a rack

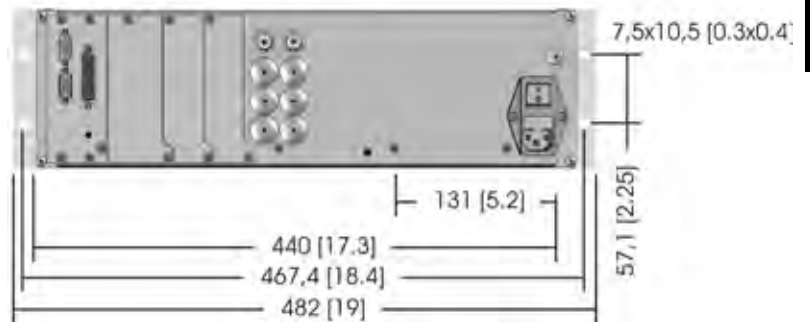
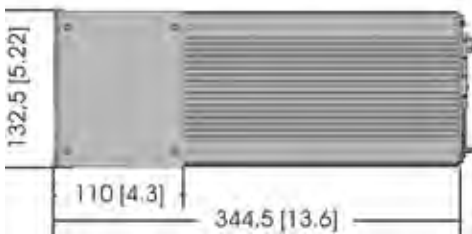
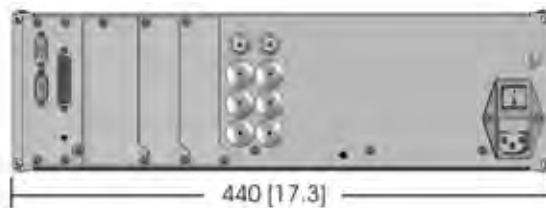
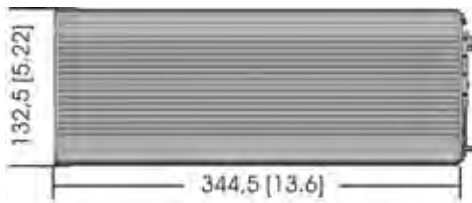




approx. values in mm [in]

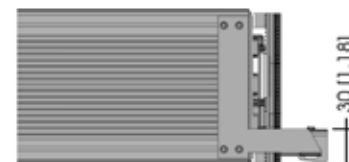
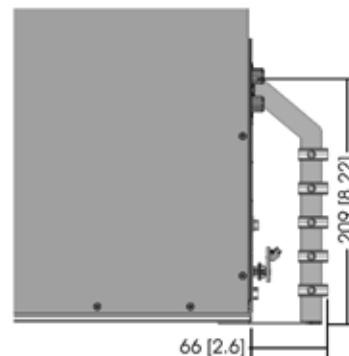
**Fig. 2-6:** X-STREAM XEGC - dimensions

2.6.1 Installation - X-STREAM XEGC, X-STREAM XEGP

approx. values in mm [in]



|   |  |
|---|--|
|  |  <b>CAUTION</b> |
|   | <b>RACK INSTALLATION HAZARD</b>  |
|   | The brackets are not designed to carry the weight of the instrument!                               |
|   | Support the instrument, when rack mounting!  |
|   | Disregarding may cause personal injury and damaged equipment.                                      |



Strain relief bracket, detail  
 (model with clamping adapters)

Fig. 2-7: X-STREAM XEGP - dimensions

## 2.6.1 Installation - X-STREAM XEGC, X-STREAM XEGP

### Signal inputs and outputs

The number of signal outputs actually available varies according to the unit's configuration.

#### Analog signals

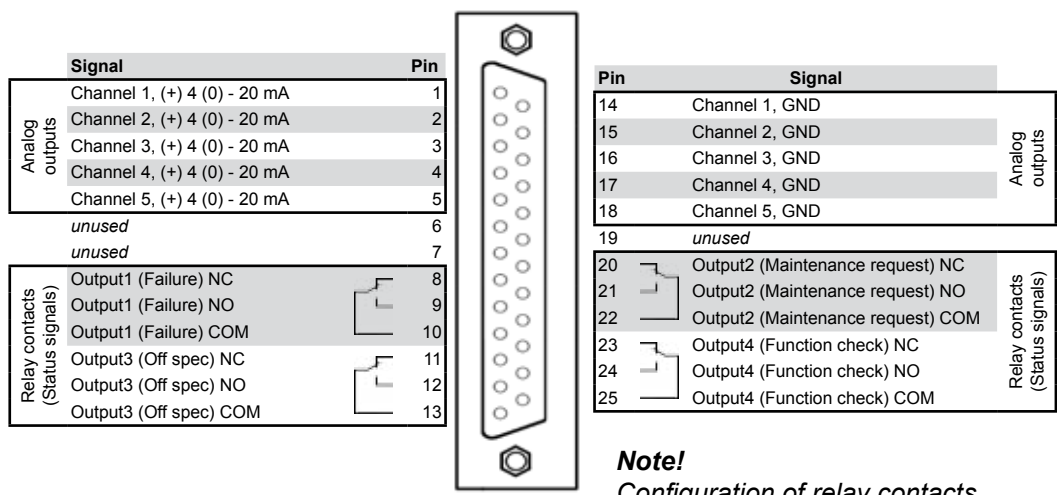
#### Relay outputs

Analog signals and relay outputs are located on a shared 25-pin submin socket X1, or on an optional terminals adaptor XSTA (👉 page 2-23).

|   |   |
|---|---|
| Specification of analog signal outputs: | 4 (0) - 20 mA; burden: $R_B \leq 500 \Omega$            |
| Specification of relay outputs 1-4:     | Dry relay change-over contacts can be used as NO or NC. |
| Electrical specification:               | max. 30 VDC, 1 A, 30 W                                  |

**Note!**

Consider the installation notes in section 2.7.




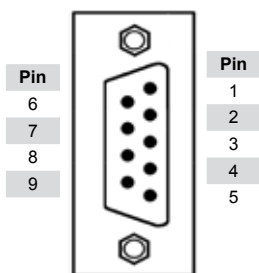
**Note!**  
Configuration of relay contacts as per standard factory setting (NAMUR status signals)

**Fig. 2-8:** Socket X1 - Analog & Digital Outputs 1-4

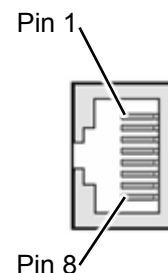
2.6.1 Installation - X-STREAM XEGC, X-STREAM XEGP

Serial interface

For specifications and notes on control, see  chapter 7 of the X-STREAM XE instruction manual.



| Pin no. | MOD 485/<br>2 wire | MOD 485/<br>4 wire | RS 232   |
|---------|--------------------|--------------------|----------|
| 1       | Common             | Common             | Common   |
| 2       | not used           | not used           | RXD      |
| 3       | not used           | not used           | TXD      |
| 4       | not used           | RXD1(+)            | not used |
| 5       | D1(+)              | TXD1(+)            | Common   |
| 6       | not used           | not used           | not used |
| 7       | not used           | not used           | not used |
| 8       | not used           | RXD0(-)            | not used |
| 9       | D0(-)              | TXD0(-)            | not used |




| Pin no. | Signal   |
|---------|----------|
| 1       | TX+      |
| 2       | TX-      |
| 3       | RX+      |
| 6       | RX-      |
| other   | not used |

Ethernet connector

Fig. 2-9: Plug X2 - Serial interface

Notes!

Consider the installation notes in section 2.7. When terminal adapters are used, the Serial interface terminals are located on the same adapter as those for the **analog** signal outputs ( Appendix ).

Then a flat flexible cable, attached to the terminal adapter, is used for connecting the illustrated 9-pole plug.

X-STREAM analyzers are classified DTE (Data Terminal Equipment).

# X-STREAM XE

## 2.6.1 Installation - X-STREAM XEGC, X-STREAM XEGP

### Digital In- and Outputs

|  |                          |  |
|--|--------------------------|--|
| 7 or 14 digital inputs<br>(X-STREAM XEGC: max. 7 inputs)                 | electrical specification | max. 30 V, internally limited to 2.3 mA<br>HIGH: min. 4 V; LOW: max. 3 V<br>common GND         |
| 9 or 18 additional relay outputs<br>(X-STREAM XEGC: max. 9 add. outputs) | electrical specification | Dry relay change-over contacts can be used as NO or NC<br>max. load. 30 V; 1 A; 30 W resistive |

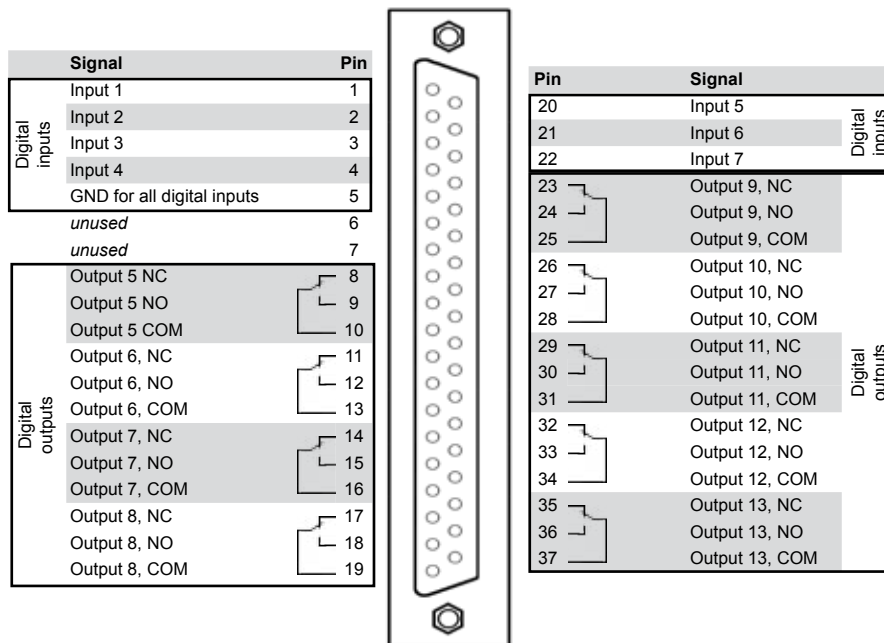
Digital in- & outputs are located on shared 37-pin submin sockets (X4.1 or X4.2), or on optional terminals adaptor XSTD (page 2-26)

### Notes!

Depending on model and configuration, an analyzer may be fitted with up to 2 of these sockets (the unit is thus equipped with 14 digital inputs and 18 digital outputs).

To aid identification, the sockets are labelled X4.1 and X4.2.

Consider the installation notes in section 2.7.



### Note!

The configuration illustrated here is that of the first socket, labelled X4.1.

Inputs 8-14 and outputs 14-22 are on the second socket (X4.2), if installed.

Fig. 2-10: Sockets X4.1 and X4.2 - Pin configuration



2.6.1 Installation - X-STREAM XEGC, X-STREAM XEGP

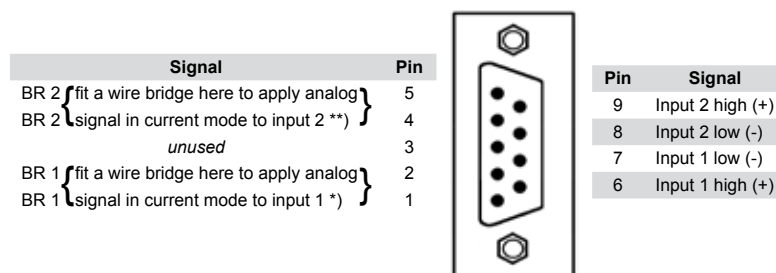
Analog Inputs

|                 |                          |   |
|-----------------|--------------------------|---|
| 2 analog inputs | electrical specification | 0 - 1 V, 0 - 10 V (software selectable) $R_{in} = 100\text{ k}\Omega$<br>optional (requires to fit wire bridges, see figures):<br>4 (0) - 20 mA ; $R_{in} = 50\ \Omega$<br>optically isolated from analyzer GND<br>protected against overload up to $\pm 15\text{ V}$ or $\pm 20\text{ mA}$ |
|-----------------|--------------------------|---|

Analog inputs are located on a 9-pole submin-D-connector (X5) or on an optional terminals adaptor XSTI (page 2-27).

**Note!**

Consider the installation notes in section 2.7.



\*) alternatively set jumper P2 on electronics board XASI

\*\*\*) alternatively set jumper P1 on electronics board XASI

Fig. 2-11: Plug X5 - analog inputs

## 2.6.2 Installation - X-STREAM XE Field Housings

### 2.6.2 X-STREAM XEF, X-STREAM XDF

Fitted with four eyebolts and featuring IP66/Type 4X protection, the X-STREAM XE field

housing can be mounted in the open air on a wall or frame with no extra work.

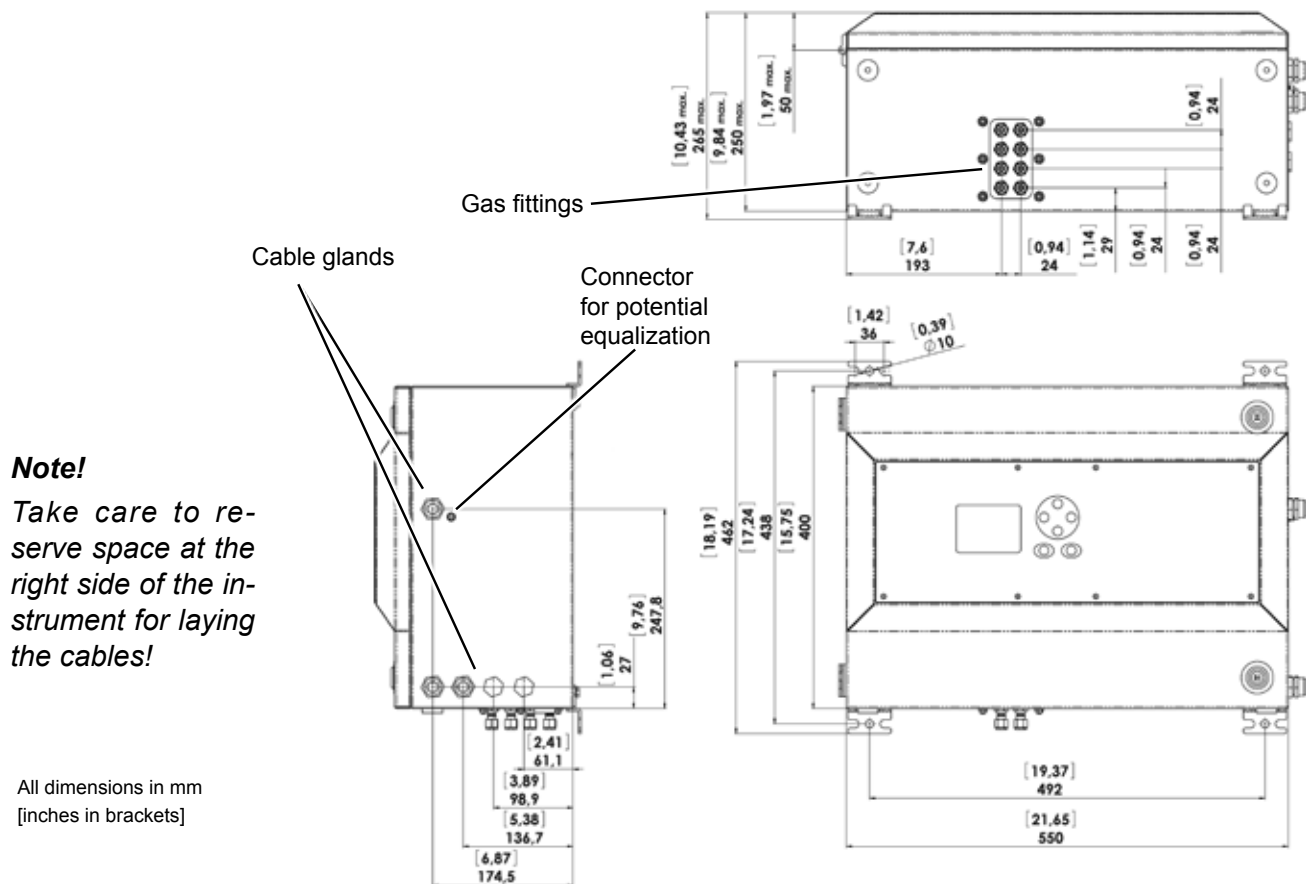


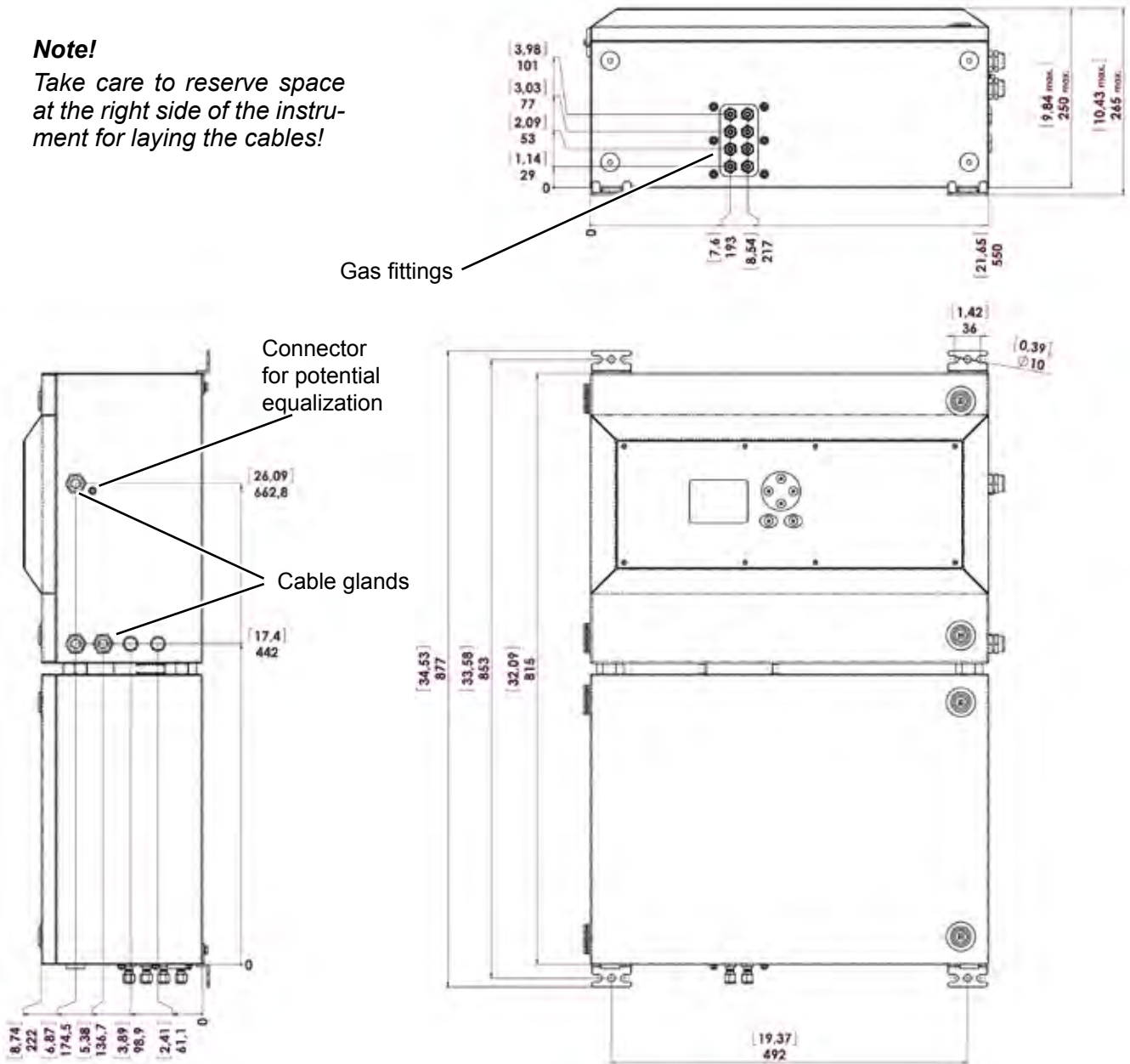
Fig. 2-12: X-STREAM XEF - dimensions for installation

|  |  |
|--|--|
|  | <h2>⚠ CAUTION</h2>   |
|  | <p style="text-align: center;"><b>HEAVY INSTRUMENT</b></p> <p><b>X-STREAM XEF / XDF analyzers, intended to be wall mounted or outdoor installed, weigh up to 45 kg (99 lbs), depending on the chosen options!</b></p> <p><b>Use two persons and/or suitable tools for transportation and lifting these instruments!</b></p> <p><b>Take care to use anchors and bolts specified to be used for the weight of the instruments!</b></p> <p><b>Assure that the wall / device for installation is sufficiently attached and stable to carry the instrument!</b></p> |

2.6.2 Installation - X-STREAM XE Field Housings

**Note!**

Take care to reserve space at the right side of the instrument for laying the cables!



All dimensions in mm  
 [inches in brackets]

Fig. 2-13: X-STREAM XDF - dimensions for installation

## 2.6.2 Installation - X-STREAM XE Field Housings

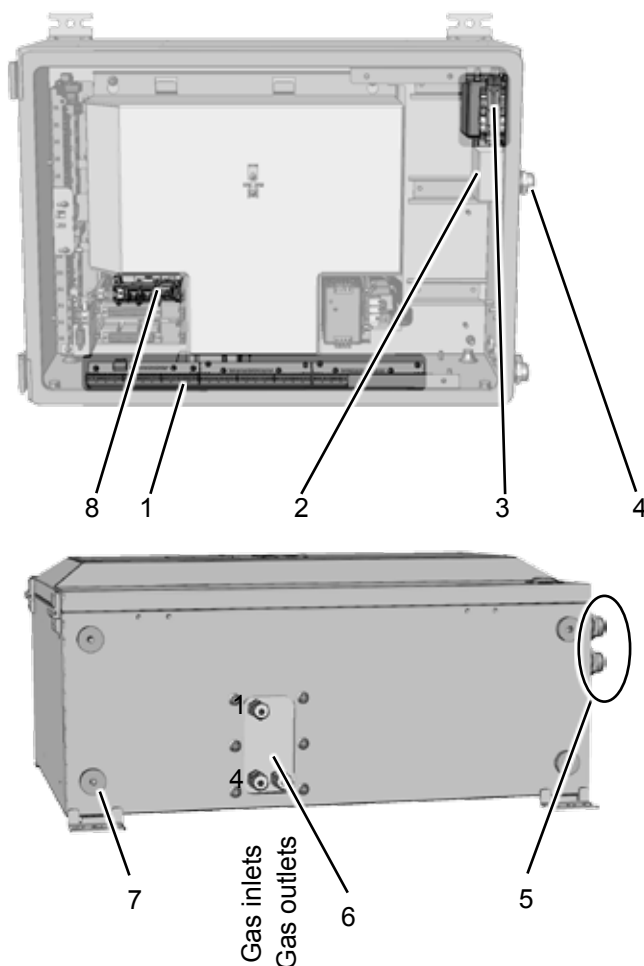
Power and signal cables are connected using internal screw-type terminals. This requires opening the unit, which in turn requires releasing the fasteners on the housing.

Gas connectors are accessible from the outside, on the underside of the instrument.

The number and configuration of the gas inlets and outlets depends on the analytical

application, and is noted on a sticker on the underside of the instrument next to the connectors.

To simplify installation, we recommend labeling the gas lines in accordance with these markings. This avoids confusion should the analyzer need to be disconnected for maintenance.



### **Note on XDF!**

*In case of the dual compartment version XDF, the electrical connections are established in the upper compartment, and the gas connections to fittings at the lower compartment.*

*Besides this, the design and layout of terminals and fittings are the same as with the single compartment version XEF.*

- |   |  |
|---|--|
| 1 Terminals for signal cables             | 5 Glands for signal cables               |
| 2 Mains filter                            | 6 Gas inlets and outlets                 |
| 3 Power connections with integrated fuses | 7 Plugs for openings to connect housings |
| 4 Glands for power cable                  | 8 Ethernet connectors (optional)         |

**Fig. 2-14:** X-STREAM XE Field housing - Arrangement of terminals, cable glands and gas connectors

2.6.2 Installation - X-STREAM XE Field Housings

**Gas connections**

|                                    |                              |
|------------------------------------|------------------------------|
| Gas connections                    |                              |
| max number                         | 8                            |
| max for purging (incl. / separate) | 2 incl.                      |
| material                           | PVDF; stainless steel (opt.) |
| sizes                              | 6/4 mm; 1/4"                 |

**Signal in- and outputs**

**Preparation of signal cables**

All signal cables are connected to screw-type terminals located inside the housing. Access to the internal components is gained by releasing the two fasteners at the top of the unit and opening the front panel downwards.

All cables must be fed through cable glands and secured with a gland nut.

Properly installed, the glands act as a strain relief and guarantee EMC (electromagnetic compatibility):

**Installing cable glands with shielded cables**



1. Strip the cable
2. Expose braided shield





6. Push clamping insert into body and tighten dome nut
7. Assemble into housing and you're done!



3. Feed cable through dome nut and clamping insert
4. Fold braided shield over clamping insert
5. Make sure that braided shield overlaps the O-ring by 2 mm (3/32")

2.6.2 Installation - X-STREAM XE Field Housings

|   |  |
|---|--|
|  |  <b>WARNING</b>   |
|   | <p><b>ELECTRICAL SHOCK HAZARD</b></p> <p><b>Verify the power supply at installation site meets the specification given on the analyzer's nameplate label, before installing the instrument!</b></p> <p><b>Verify power cables are disconnected and/or instrument is de-energized prior to working at the terminals!</b></p> <p><b>Verify the power cord is layed with a distance of at least 1 cm (0.4 in) to any signal cable to ensure proper insulation from signal circuits!</b></p> |

The number of actually available signal outputs, and also the number of built-in modules with screw-type terminals, varies according to the configuration of the unit.

A maximum of three modules with 36 terminals each can be fitted.  
 The terminals can be accessed by opening the front panel of the instrument.

Characteristics of terminals:

|                         |  |
|-------------------------|--|
| Accepted wire gauge:    | 0.14 ... 1.5 mm <sup>2</sup> (AWG 26 ... AWG 16), end sleeves not required |
| Skinning length:        | 5 mm (0.2")  |
| Thread:                 | M2   |
| Min. tightening torque: | 0.25 Nm (2.21 in.lb)   |

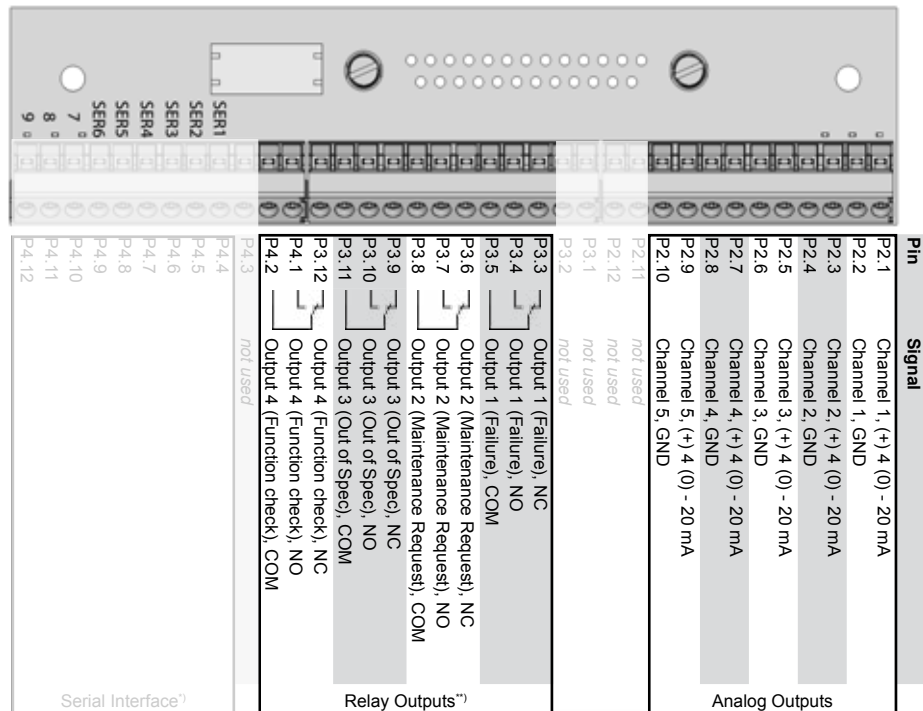
2.6.2 Installation - X-STREAM XE Field Housings

Analog signals  
 Relay outputs 1-4

Terminals for analog signals and relay outputs  
 1 - 4 are located on the outer left module  
 (terminal block X1).

|   |   |
|---|---|
| Specification of analog signal outputs: | 4 (0) - 20 mA; burden: $R_b \leq 500 \Omega$            |
| Specification of relay outputs:         | Dry relay change-over contacts can be used as NO or NC. |
| Electrical specification:               | max. 30 VDC, 1 A, 30 W                                  |

**Note!**  
 Consider the installation notes in section 2.7  
 and the notes on installing cable glands on  
 page 2-21.




<sup>\*)</sup> Configuration of relay output terminals as per standard factory setting (NAMUR status signals)

Fig. 2-15: Terminal block X1 - Analog signals and relay outputs 1-4 (XSTA)

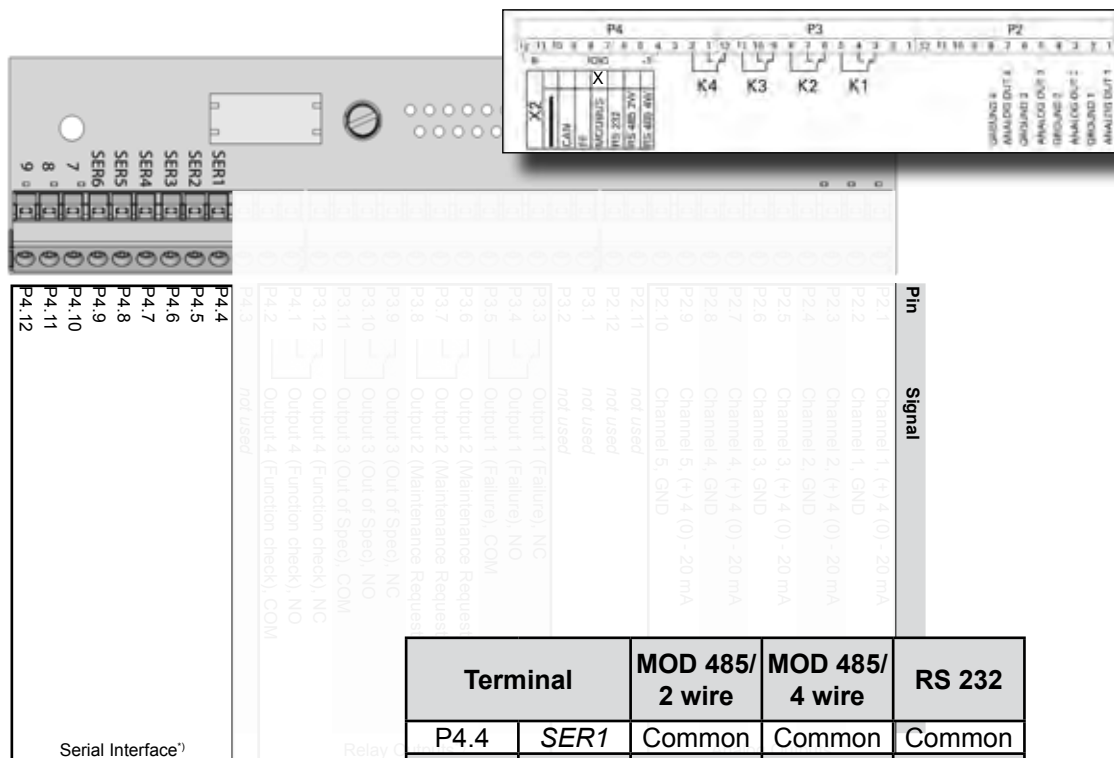
## 2.6.2 Installation - X-STREAM XE Field Housings

### Serial interface

Specification and interface control:

 X-STREAM XE instruction manual, chapter 9

The 9 terminals on the left (28 - 36) of the right most strip carry the serial interface signals.



\*) See table

### Notes!

Consider the installation notes in section 2.7 and the notes on installing cable glands on page 2-21.

X-STREAM analyzers are classified DTE (Data Terminal Equipment).

Your analyzer's type of serial interface is marked on a label nearby the terminals (see sample above)

Fig. 2-16: Terminal block X1 - Serial interface



2.6.2 Installation - X-STREAM XE Field Housings

*RJ45 connection*

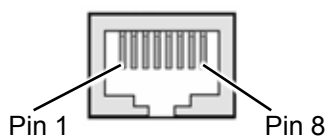
The RJ45 connectors are located on an electronics board in the card cage section of the unit.

To install this connection, a cable must be fed through the cable entry **without** a connector.

The connector can be wired on when the free end has been fed into the instrument:

We recommend the VARIOSUB RJ45 QUICK-ON connector (PHOENIX CONTACT), which is supplied with the unit and requires no special tools. Wiring instructions can be found in the separate manual supplied with the connector.

**Note!**  
Please note that, although the Modbus terminals (see previous page) are still installed, they are not connected!



| Pin no.      | Signal          |
|--------------|-----------------|
| 1            | TX+             |
| 2            | TX-             |
| 3            | RX+             |
| 6            | RX-             |
| <i>other</i> | <i>not used</i> |

Fig. 2-17: X-STREAM XEF - Ethernet connector

## 2.6.2 Installation - X-STREAM XE Field Housings

### Digital inputs and relay outputs (option)

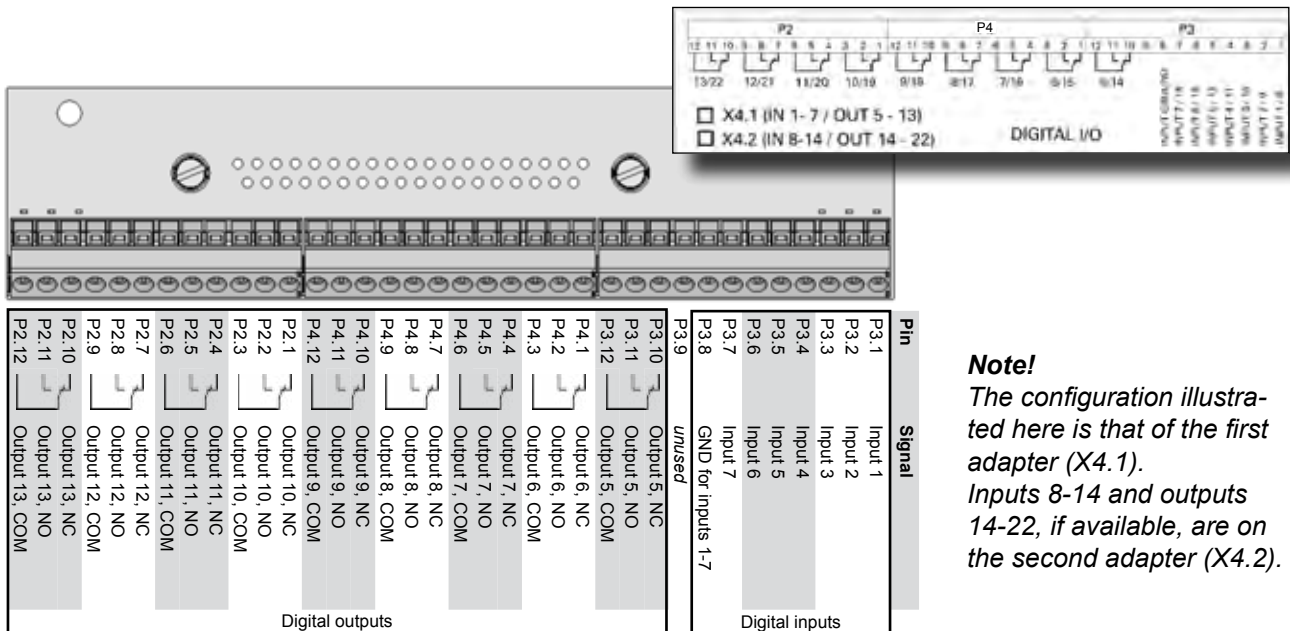
Terminals for these signals are located on the terminals board XSTD (terminal block X4).

|                                  |  |
|----------------------------------|--|
| 7 or 14 digital inputs           | max. 30 V, internally limited to 2.3 mA<br>HIGH: min. 4 V; LOW: max. 3 V<br>common GND         |
| 9 or 18 additional relay outputs | Dry relay change-over contacts can be used as NO or NC<br>max. load. 30 V; 1 A; 30 W resistive |

### Notes!

Depending on configuration, an analyzer can be fitted with up to two of these terminal blocks (the unit will then feature 14 digital inputs and 18 digital outputs). To aid identification, the sockets are labelled X4.1 and X4.2 (see sample of label to the right).

Consider the installation notes in section 2.7 and the notes on installing cable glands on page 2-21.



### Note!

The configuration illustrated here is that of the first adapter (X4.1). Inputs 8-14 and outputs 14-22, if available, are on the second adapter (X4.2).

Fig. 2-18: Terminals blocks X4 - digital inputs and outputs

2.6.2 Installation - X-STREAM XE Field Housings

Analog inputs (option)

Terminals for analog input signals are located on the terminals board XSTI (terminal block X5).

|                 |  |
|-----------------|--|
| 2 analog inputs | 0 - 1 V, 0 - 10 V (software selectable) $R_{in} = 100\text{ k}\Omega$<br>optional (requires to fit wire bridges, see figure):<br>4 (0) - 20 mA ; $R_{in} = 50\ \Omega$<br>optically isolated from analyzer GND<br>protected against overload up to $\pm 15\text{ V}$ or $\pm 20\text{ mA}$ |
|-----------------|--|

**Note!**

Consider the installation notes in section 2.7 and the notes on installing cable glands on page 2-21.

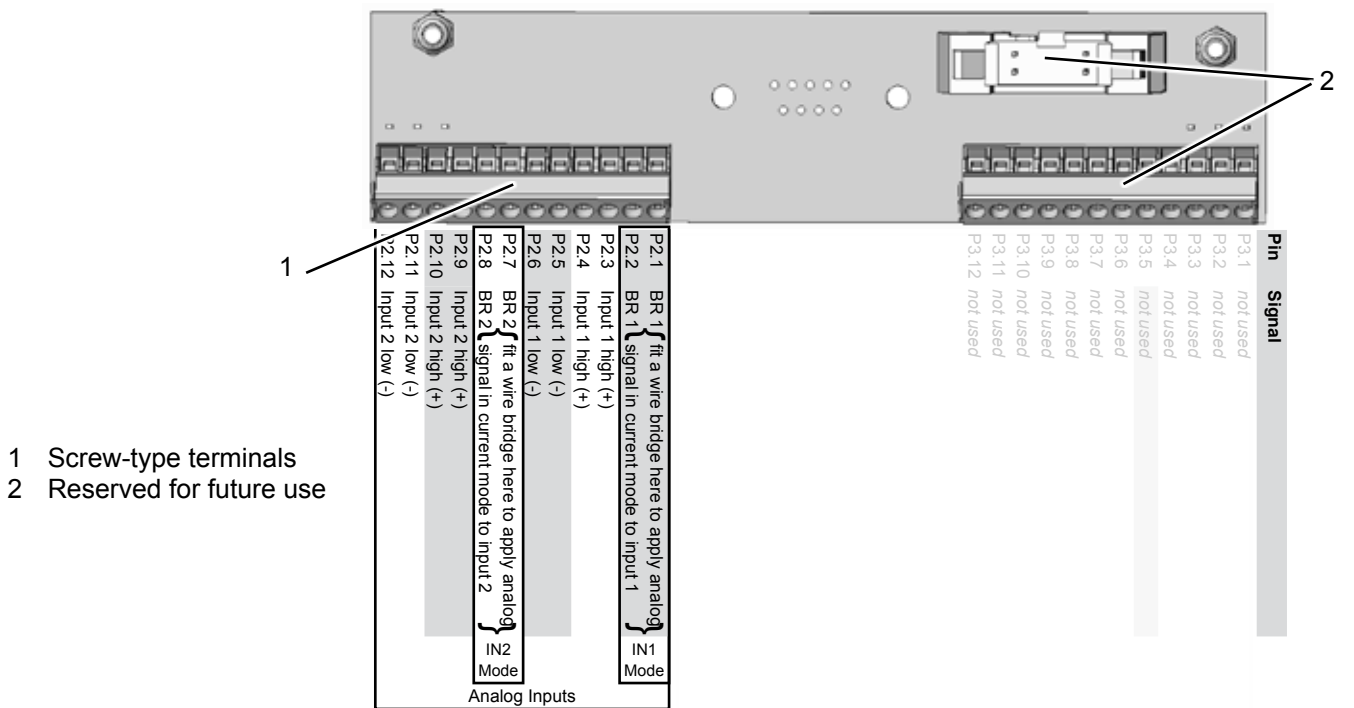




Fig. 2-19: Terminal block X5 - Analog input signals

## 2.6.2 Installation - X-STREAM XE Field Housings

### Connecting the power cord

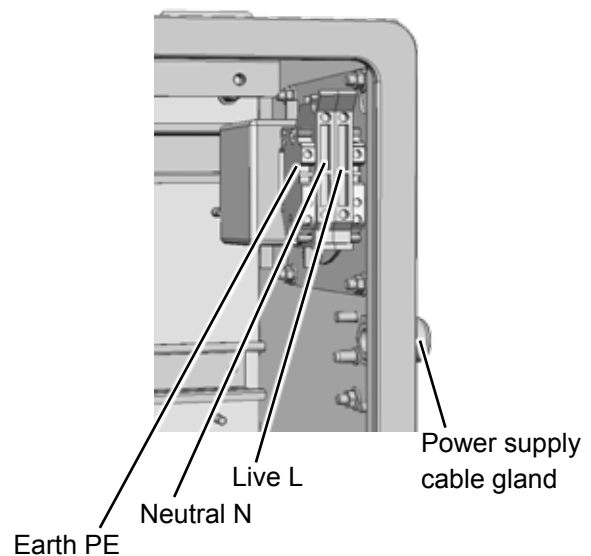
The power cord is connected to screw-type terminals located inside the housing.

|                         |  |
|-------------------------|--|
| Accepted wire gauge:    | 0.2 ... 4 mm <sup>2</sup> (AWG 24 ... AWG 12)                  |
| Recommended wire gauge  | min. 1.5 mm <sup>2</sup> (AWG 15),<br>end sleeves not required |
| Skinning length:        | 8 mm (0.315")  |
| Thread:                 | M3   |
| Min. tightening torque: | 0.5 Nm (4.4 in.lb)   |

|   |  |
|---|--|
|  |  <b>WARNING</b>   |
|   | <p><b>ELECTRICAL SHOCK HAZARD</b></p> <p><b>Verify the power supply at installation site meets the specification given on the analyzer's nameplate label, before installing the instrument!</b></p> <p><b>Verify power cables are disconnected and/or instrument is de-energized prior to working at the terminals!</b></p> <p><b>Verify the power cord is layed with a distance of at least 1 cm (0.5") to any signal cable to ensure proper insulation from signal circuits!</b></p> |


Feed the power cable through the cable gland at the instrument's right side and strip the outer insulation. Strip the individual wires and connect to the terminals (a label is located next to the terminals on the mains filter housing).

Finally, tighten the outer dome nut to secure the power cable.



**Fig. 2-20:** Power supply connections

2.6.2 Installation - X-STREAM XE Field Housings

|   |  |
|---|--|
|  |  <b>WARNING</b>   |
|   | <b>ELECTRICAL SHOCK HAZARD</b><br><b>Before completing the electrical connection of the instrument, verify cables are inserted and connected in correct manner!</b><br><b>Ensure the earthing conductor (protective earth; PE) is connected!</b> |

When all connections are correctly made and checked,

- close the front panel and secure with the two fasteners.

## 2.7 Installation - Notes on Wiring

### 2.7 Notes on Wiring Signal Inputs and Outputs

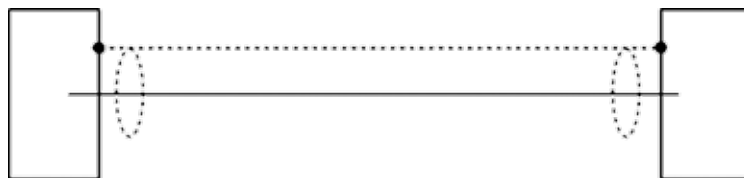
Emerson Process Management has made every effort during the development process to ensure that the X-STREAM analyzer series ensures electromagnetic compatibility (EMC) with respect to emission and interference resistance, as confirmed by EMC measurements.

However, EMC is not only influenced by the design of the instrument, but to a large degree by the on-site installation process. Please observe the following sections and precautions to guarantee the safe and problem-free operation of this analyzer.

#### 2.7.1 Electrical Shielding of Cables

In order to minimise ambient electromagnetic interference, it is necessary to take care making all electrical connections between the analyzer and any other devices:

- We recommend using only shielded signal cables. The shielding must be connected at both ends to the housing (fig. 1-24).



**Fig. 2-21:** Shielded signal cable, shielding connected at both ends.

2.7 Installation - Notes on wiring

On-site conditions often differ from test environments and may require special precautions. Such a case arises when strong electromagnetic fields which could induce an interference current in the shielding. This type of current creates a potential difference between the connected housings.

Two possible methods of eliminating this are described here. Fitters familiar with EMC problems must decide which method should be employed.

- The shielding is connected only at one end (connecting to the analyzer is recommended): this gives better protection against external interference, and interference currents are prevented because the ground loop is interrupted.

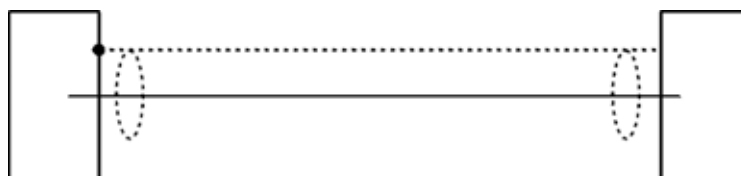


Fig. 2-22: Shielded signal cable, shielding connected at one end.

- Cables with double shielding: in this case, one shielding is connected to the analyzer housing, the other shielding to the external device. This is advantageous when both units are supplied from different grids (e.g. when installed in different buildings).

This method is more expensive, but gives the best protection against external interference and against interference currents.

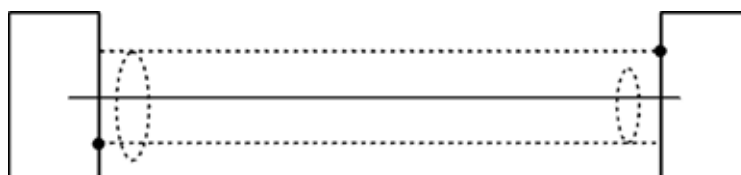


Fig. 2-23: Signal cable with double shielding, shieldings connected at alternate ends.

## 2.7 Installation - Notes on wiring

### **X-STREAM XEGP/XEGC with terminal adapters**

In order to avoid measured values being influenced by external interference signals when terminal adapters are in use, the signal cable shieldings must be connected to the analyzer housing by means of shield connector terminals:

- Strip the signal cable to a length of 20 cm (8"). Take care to not damage the braided shield!
- Pull up the contact part of the shield connector terminal,
- feed the cable through as illustrated in fig. 2-24, and
- release the contact part down onto the braided shield.

The result is a secure contact with the cable shield, improving the unit's immunity against interference from other electronic devices.

Finally connect the individual wires as described before.



**Fig. 2-24:** Shield connector terminal with cable

The shield connector must be ordered to fit the cable diameter, and can be retrofitted:

|                                    |                 |
|------------------------------------|-----------------|
| Ø 1.5 ... 6.5 mm (0.06" ... 0.25") | part # ETC02019 |
| Ø 5 ... 11 mm (0.2" ... 0.43")     | part # ETC02020 |
| Ø 10 ... 17 mm (0.4" ... 0.66")    | part # ETC02021 |
| Ø 16 ... 24 mm (0.63" ... 0.94")   | part # ETC02022 |



2.7 Installation - Notes on wiring

2.7.2 Wiring Inductive Loads

Switching inductive loads creates electromagnetic interference:

When an inductive load (e.g. relay, valve) is switched off, the magnetic field resists the change in current; this induces a high voltage across the coil contacts (several hundred volts). This impulse propagates through the connected cables and can influence any electrical devices nearby or destroy signal inputs and outputs. This can be avoided with a simple precaution:

- A silicon diode is connected in parallel to the load's contacts. The induced impulse is thus short-circuited at its source. The cathode must be connected to the positive end of the coil, the anode to the negative end (fig. 1-28).

Compatible filter components for standard valves are available on request.

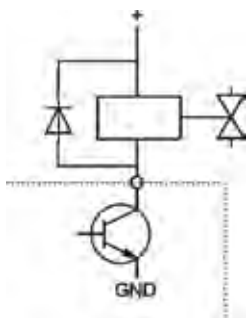


Fig. 2-25: Suppressor diode for inductive loads.

2.7.3 Driving High-Current Loads

Loads which draw a current in excess of the specifications for X-STREAM series analyzer outputs (>30 mA / >1 A) may not be directly driven from digital or relay outputs.

Such loads require external relays serving as de-coupling modules: the X-STREAM output drives the external relay, which in turn drives the load.

In order to avoid interference, we recommend supplying the analyzer and the high-current loads from different sources (fig. 1-29).

As previously described, the use of suppressor diodes for inductive loads is highly recommended.

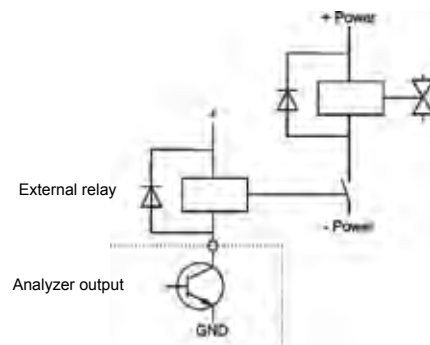


Fig. 2-26: Driving high-current loads

2.7 Installation - Notes on wiring

2.7.4 Driving Multiple Loads

Frequently, several loads in one system are controlled by several analyzer outputs, whereby the power for the loads derives from a common source.

Special care is needed when wiring the loads to minimize interference from switching these loads:

- **avoid** connecting the loads in series:

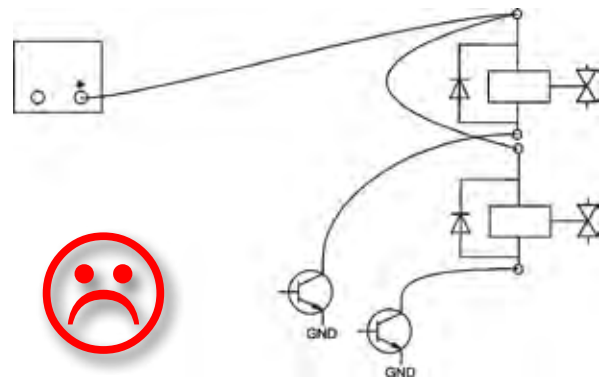


Fig. 2-27: Loads in series

- **It is recommended** the loads to be wired in parallel, and each load connected separately to the power supply. Beginning at the distribution point, both the + and the - wires for each load are laid together to the load (fig. 2-28). Interference is further reduced if a twisted multi-core cable is used.

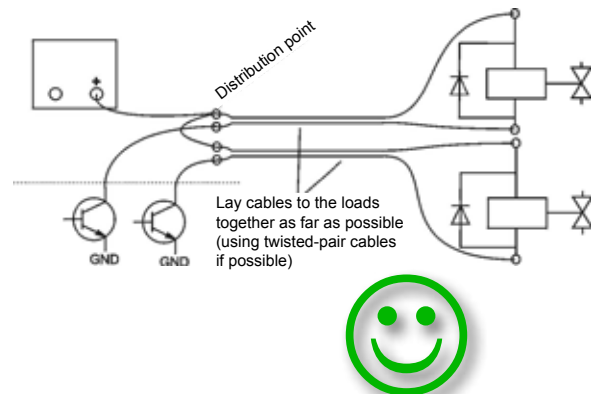


Fig. 2-28: Loads in parallel

## **Chapter 3**

### **Startup**

#### **3.1 Introduction**

Once the unit has been unpacked and installed, we recommend to first check the settings, and if necessary adjust them to the user's needs. e.g:

- What hardware is installed?
- Is the unit configured to your needs (alarms, inputs, outputs, etc.)

In order for the information in this chapter to be of any relevance, the unit must have been installed according to the instructions in chapter 4.

The following pages describe how to perform a leak test, navigate through the menus and what is to be observed when configuring the unit. For the first startup after installation, follow the step-by-step instructions for navigating the menus, allowing you to familiarise yourself with the unit and its software, and if necessary adjust the settings to your needs.

## 3.2 Leak Test

### 3.2 Performing a Leak Test

To achieve best and proper measuring results you must ensure the gas path system does not have leaks.

The following procedure describes how to perform a leak test with focus on the instrument.

The gas path system should be leak tested at least on a bimonthly basis and after maintenance, replacement or repair of gas path parts.

**Note!**

We recommend to include external equipment (e.g. cooler, dust filters, etc.) into a leak test!

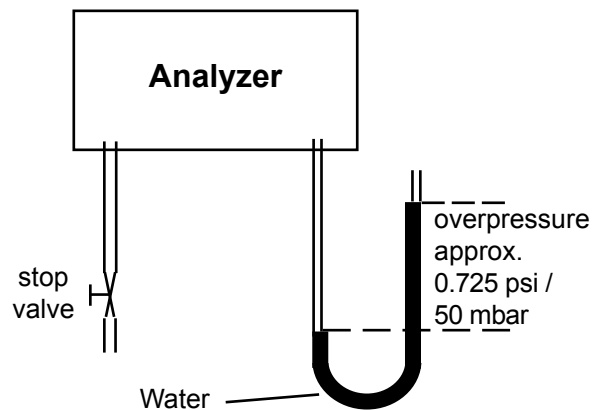
#### Required tools

- U-turn manometer for max. 1.45 psi (100 mbar)
- Stop valve

#### Procedure

- Connect the water filled u-turn manometer to the analyzer's sample gas output (disconnect external gas lines).
- Install the stop valve between gas input fitting and a nitrogen (N<sub>2</sub>) supply.
- Open the stop valve until the internal gas path is under pressure of approx. 0.725 psi/50 mbar (corresponding to 19.7 inch/500 mm water column)
- Close the stop valve. After a short time for the water to balance, the water level must not change over a time period of approx. 5 minutes!

|  |   |
|--|---|
|  | <b>! WARNING</b>  |
|  | <b>HAZARD FROM GASES</b>  |
|  | <p><b>Before opening gas paths they must be purged with ambient air or neutral gas (N<sub>2</sub>) to avoid hazards caused by toxic, flammable, explosive or harmful to health sample gas components!</b></p> |



**Fig. 3-1:** Leak Testing with U-turn Manometer

**Max. pressure 7.25 psig (500 mbar)!**



**Multi channel instruments: Analyzers with parallel tubing require separate leak tests for each gas path !**

3.3 Symbols Used

3.3 Symbols and Typographical Conventions

In the following sections, the symbols and typographical conventions explained below are used to describe the software menus and navigation.

| Symbol                             | Description  |
|------------------------------------|--|
| <b>Within Process Descriptions</b> |  |
|                                    | Menu title   |
|                                    | Parent (SETUP) and current menu (ANALOG OUTPUTS)   |
|                                    | As an example, the menu for Output1 is shown; the menus for outputs 2 to 5 look identical  |
|                                    | To access the current menu, access level code 3 has to be entered somewhere in the menu history  |
| <br><br><br>                       | Access levels:<br><br>Access level 1<br>( <i>user</i> )<br><br>Access level 2<br>( <i>expert</i> )<br><br>Access level 3<br>( <i>administrator</i> )<br><br>Access level 4<br>( <i>service level</i> ) |
|                                    | Screen shot<br>(here: MAIN MENU)   |

| Convention                  | Description   |
|-----------------------------|---|
| <b>Within Text</b>          |   |
| <i>(MENU TITLE)</i><br>6-12 | For a detailed description of <i>MENU</i> , see page 6-12.      |
| CONTROL                     | Identifies the CONTROL menu, e.g. "press ENTER to open CONTROL" |
| CONTROL - RANGES            | From within the CONTROL menu, select the RANGES menu.           |
| "Valves"<br>"Control.."     | Parameter or menu line name                                     |
| <b>Never, 1 min</b>         | Values to be selected   |
| <b>0 ... 2000</b>           | Value to be entered   |
| ENTER                       | press key (here: ENTER key)                                     |

## 3.4 Front Panel Elements

### 3.4 Front Panel Elements

All X-STREAM XE gas analyzers have an graphic display to show measuring and status information, and the easy-to-use menu-based user interface for entering parameters. For ease of understanding, the user can at any time select one of three languages stored in

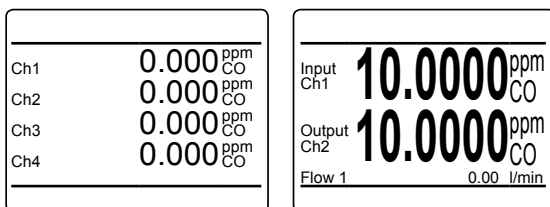
the unit (currently available: English, French, German, Italian, Polish, Portuguese and Spanish in various combinations).

Units are operated by six keys on the front panel.



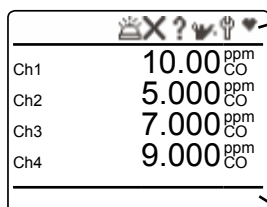
**Fig. 3-2:** X-STREAM XE front panel

### 3.4.1 Display



The graphic display has various layouts to support displaying the measuring results as well as status information and software menus. The figure to the left shows the basic measurement displays with 4 channel layout as well as a 2 channel layout.

### 3.4.2 Status Line



Status information is provided by different symbols in the display's first line:

- Bell = 'Alarm'
- Cross = 'Failure'
- Question mark = 'Off spec'
- Oil can = 'Maintenance request'
- Tool = 'Function check'
- Heart = the analyzer's 'heart beat', indicating the instrument is operating.

**Note!**

During an active webserver session, the heart symbol is replaced by a network symbol: 

Clear text messages are provided in the display's bottom line

3.4 Front Panel Elements

3.4.3 Keys



Six keys enable the use of the menu system. Depending on the operational mode (measuring, browsing menus, editing) they have the following functions:

ENTER key:

| Mode      | Function                                 |
|-----------|--|
| Measuring | Enter main menu                          |
| Browsing  | Open submenu (..) or execute command (!) |
| Editing   | Confirm new entry                        |



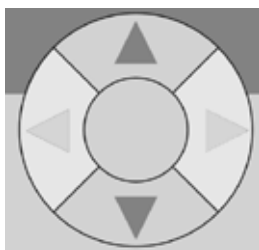
HOME key:

| Mode      | Function                      |
|-----------|-------------------------------|
| Measuring | (no function)                 |
| Browsing  | Return to measurement display |
| Editing   | Abort entry                   |



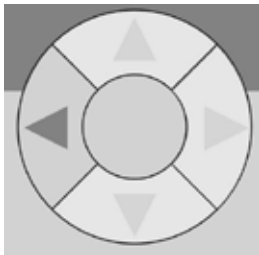
UP / DOWN keys:

| Mode      | Function   |
|-----------|--|
| Measuring | Enter main menu  |
| Browsing  | Highlight next menu line   |
|           | Open the previous/next page, when currently a line beginning with ▲/▼ is highlighted |
| Editing   | Change current parameter   |



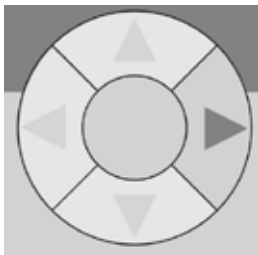
3.4 Front Panel Elements

LEFT key:



| <b>Mode</b> | <b>Function</b>  |
|-------------|--|
| Measuring   | Enter main menu or open 2 <sup>nd</sup> measurement display page (if configured) |
| Browsing    | Go up 1 level or page in menu system   |
| Editing     | Move cursor 1 char to the left   |
|             | Leave channel selection  |
|             | Cancel editing of given parameter  |
|             | Go to previous menu page, if ▲ shows in first menu line                          |

RIGHT key:



| <b>Mode</b> | <b>Function</b>  |
|-------------|--|
| Measuring   | Enter main menu or open 2 <sup>nd</sup> measurement display page (if configured) |
| Browsing    | Open submenu (.)   |
| Editing     | Go to next menu page, when ▼ shows in last menu line                             |
|             | Move cursor 1 char to the right  |



3.5 Software

3.5 Software

The analyzer software displays measurement results and status messages, allows parameters to be set and edited, and maintenance functions (e.g. calibration) to be carried out.

The software is organised hierarchically: The topmost level is called MEASUREMENT DISPLAY, followed by a MAIN MENU; all other menus and submenus are arranged below.

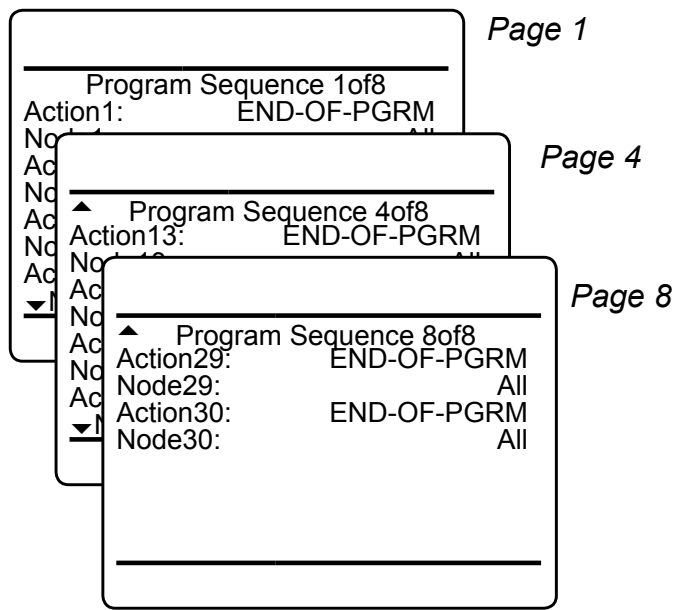
Menu lines can perform different functions, to be distinguished by the following characteristics:

| Function                        | Description  |
|---------------------------------|--|
| Text                            | Simple text (not selectable with cursor)   |
| Editable variables / parameters | <p>A variable description shows a colon; the line can be made up of up to 3 elements:</p> <ol style="list-style-type: none"> <li>1. description</li> <li>2. value (number or text)</li> <li>3. unit (optional)</li> </ol> <p><i>Examples:</i><br/>                     Span gas: 2000 ppm<br/>                     Tol.Check: Off</p> <p>Pressing <i>ENTER</i> in an editable variable line highlights the value to be changed.</p> <p>The optional unit can only be changed utilizing a setup menu.</p> <p>Variables shown without a colon cannot be edited, they are for information only.</p> |

| Function           | Description  |
|--------------------|--|
| Executable command | <p>A command line text ends in an exclamation mark; pressing <i>ENTER</i> with such a line highlighted, the command is executed, e.g. a calibration procedure.</p> <p><i>Example:</i><br/>                     Start calibration !</p> |
| Selectable submenu | <p>A menu line text ends in two dots. Press <i>ENTER</i> with a menu line highlighted to open the submenu.</p> <p><i>Example:</i><br/>                     Setup..</p>   |

**3.5 Software**

**Browsing**



Some menus have more entries than can displayed at once. In these menus, an indicator in the last (▼) and/or first (▲) line indicates the direction the menu continues in.

In the example to the left

- page 1 continues downwards
- page 4 continues upwards and downwards
- page 8 continues upwards.

To show the next page (indicator ▼ )

- place the cursor in the last accessible line and press *DOWN* or
- press *RIGHT*, irrespective of where the cursor is located.

To show the previous page (indicator ▲ )

- place the cursor in the first accessible line and press *UP* or
- press *LEFT*, irrespective of where the cursor is located.

3.5 Software

**Editing**

The editing mode enables changing parameters. It is initiated by pressing *ENTER*.

If the selection is a **parameter list**, the current entry is highlighted and may be changed by *UP* and *DOWN*.

If the selection is a **value**, the cursor is placed over the last character. Use *UP* and *DOWN* to change it.

Use *LEFT* and *RIGHT* to select another character.

The type of available characters depends on the position of the cursor:

- It is not possible to select the minus sign or decimal point as the last character.
- It is not possible to select the decimal point in integer values.
- For decimal numbers, the decimal point can be placed anywhere within certain limits.

There are two ways to exit the data entry mode:

*ENTER*: the entry is verified. If it is accepted, it is saved and the new value displayed; if not, an error message is displayed.

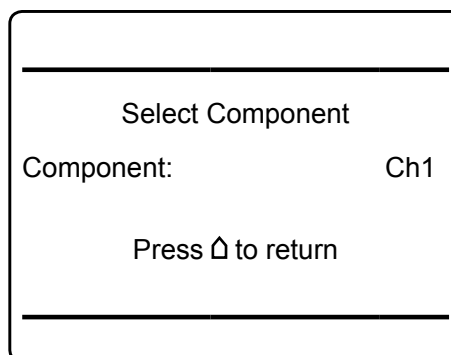
*HOME*: Cancel: all settings and changes are reset to their former values.

**Component selection menu**

Within the analyzer software, one can distinguish between analyzer related and component related menus: While the first contain entries, relevant for the analyzer (e.g. time setting), the second contain entries relevant for a specific component (channel) only (e.g. calibrating a channel).

For single channel analyzers, editing any channel specific parameter will only effect this one channel.

Different for multi-channel analyzers: Such instruments require selecting a channel prior to changing channel related parameters. When a channel related menu entry is selected, automatically a **SELECT COMPONENT** menu shows up, to select the component of interest, or to cancel the current action.



Select the component / channel you want to work with, and press *ENTER*.

This menu does not show on single-channel units.

Within menu descriptions, the following points out, that for multi-channel instruments a selection is required:



*Multi-channel unit:*  
In **SELECT COMPONENT** select the channel to be ...

## 3.5 Software

### 3.5.1 Access Levels & Codes

Access levels can be used to prevent changes to parameters by unauthorised personnel. The X-STREAM menu system supports **four prioritized** access levels, which can be activated and deactivated separately, and should be supplied with their own access codes.

**Level four** has the highest priority and is used for factory settings — only qualified EMERSON service personnel have access to this level.

**Level three** gives access to system admin parameters, e.g. for configuring data acquisition systems communication.

**Level two** covers the expert settings, e.g. basic settings for calibrations and measurements.

**Level one** is the user level and includes

- parameters which should be set by trained personnel only.
- functions, not to be started by any person (e.g. start calibrations).

All menus not assigned to one of these levels are not editable or of minor relevance.

Within this manual, the descriptions of the menus and procedures also indicate, which level the menus are assigned. These assignments cannot be changed.

Access codes for levels 1 to 3 can be defined, activated and deactivated by the client. The analyzer is delivered with the following settings:

| Level | Access code | Status |
|-------|-------------|--------|
| 1     | 00000001    | Off    |
| 2     | 00000002    | Off    |
| 3     | 00000003    | Off    |



**We recommend to set new access codes, if you want to use this option!**

#### Notes!

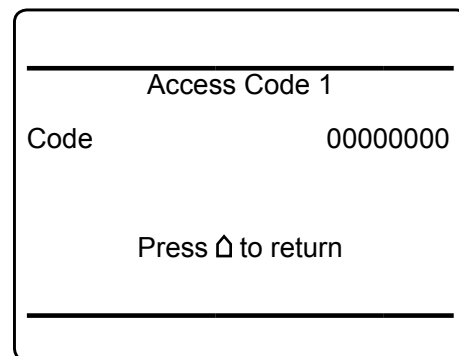
*If a low level is **locked** (status **On**), all higher levels will also be **locked**.*

*If a high level is **accessible** (code entered when requested by a menu page), automatically all lower levels are also **accessible**.*

*For above reasons, it is always possible to enter a higher code than requested, to gain access to a menu (e.g. if access code 1 is requested, you may also enter access code 2).*

#### Entering access codes

If an access code is required for a menu, a message like the following appears:



To enter the code, press

- *UP/DOWN* to change the currently selected digit,
- *LEFT/RIGHT* to select a different digit,
- *ENTER* to submit the code

or

- *HOME* to exit the edit mode and return to the previous display.

### 3.6 Powering Up

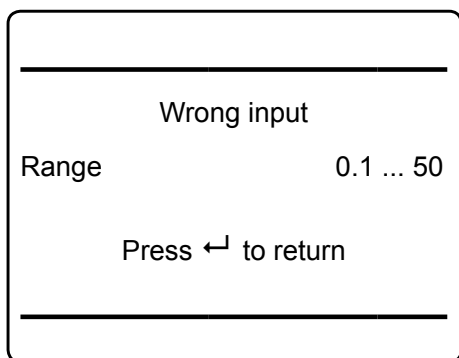
#### 3.5.2 Special Messages

Depending on the last action performed by the user, one of the following messages may be displayed to assist or inform the user.

##### **Information on incorrect entry:**

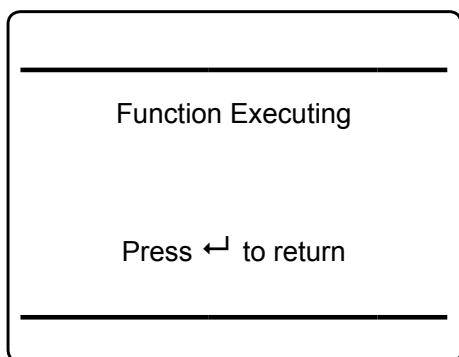
The value entered by the user is outside valid limits. The display indicates what limits apply.

Press  $\leftarrow$  to return to the previous screen to enter an acceptable value.



##### **Confirmation of execution of function:**

Confirms that a function or procedure (e.g. calibration) has been started, or cancelled. The message automatically disappears after a few seconds.



#### 3.6 Powering Up

##### 3.6.1 Boot Sequence

When the unit is powered up, a series of internal tests is automatically performed. During this time the front panel keys are disabled, while the remaining time counts down in the display.

##### 3.6.2 Measurement Display

The measurement display is shown

- automatically on completion of the boot sequence
- when *HOME* is pressed
- automatically after a set period of time of inactivity (i.e. with no keys being pressed).

The information displayed in the four lines of the measurement display can be determined by the operator:

- Sample gas components, measuring results and measuring units for each channel
- secondary measurements, e.g. pressure, gas flow, temperature
- nothing (empty line)

The factory settings are as follows:

- Line 1: measured value of channel 1
- Line 2: measured value of channel 2
- Line 3: measured value of channel 3
- Line 4: measured value of channel 4

##### **Note!**

*If less than four channels are installed in the unit, only the measureands for these channels are available for selection.*

# X-STREAM XE

## 3.6 Powering Up

SETUP enables several additional configurations, e.g.


- 2 pages measurement display
- different font sizes

The very first display line shows

- a flashing heart, showing the instrument is operating
- one or more status pictograms, if (NAMUR) status are active. Some of these are explained by a text message in the last line
- a channel indicator, if the current menu page is related to a specific channel only.

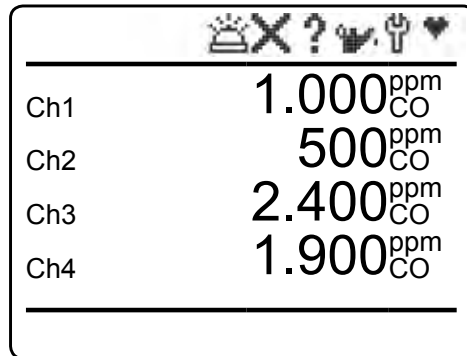
The display's bottom line shows plain text status information (errors, maintenance requests, function checks or off-spec performance).

Active messages are stored in an internal buffer. If there is more than one message in the buffer, the display will cycle through.

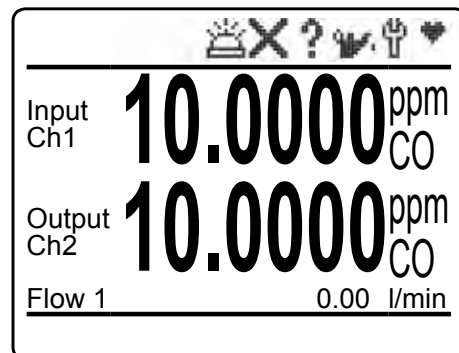
Most messages also activate a NAMUR relay (if a relay has been assigned to that NAMUR function;  X-STREAM XE instruction manual).

**Note!**

*There are also functions, that do activate a relay, but are not shown on the display (e.g. concentration alarms). In such cases, check the status menu for more information.*



4 lines display



2 lines display with additional secondary parameter line

### MEASUREMENT DISPLAY

### 3.7 Language Settings

#### 3.7 Language Settings

If the analyzer is operational and it becomes clear that the incorrect language has been set, which is unintelligible to the operator, the

following sequence of keypresses (starting at the measurement display) can be used to set the language.



If the system has been set up accordingly, the code for access level 1 must be entered at this point to enable access to the following menu.

**Note!**

The factory setting for this unit is "no code required". For ease of operation, it is recommended to use the factory settings for access codes while setting up the unit for the first time. In the following sections, therefore, no more reference will be made to any need for entering a code.

**Note!**

Pressing ENTER the 3<sup>rd</sup> time in this sequence highlights the "Language" line.

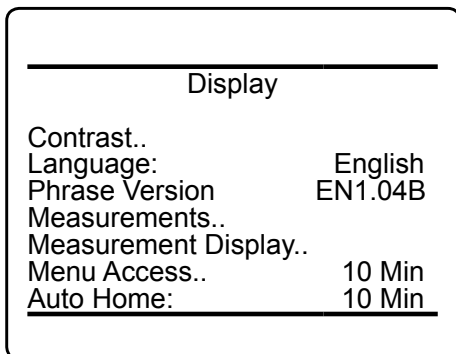
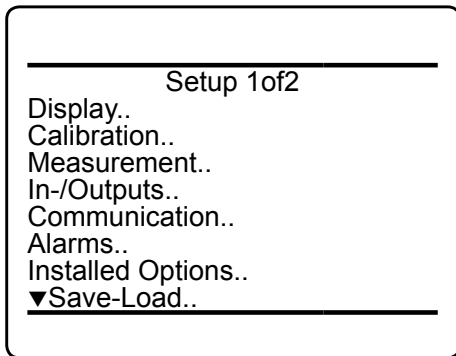
- DOWN changes the language.
- ENTER sets this language and the display is updated accordingly.
- If the selected language is not the intended, repeat the last three steps until the intended language is set.


## 3.8 Checking the Settings

### 3.8 Checking the Settings

The following sections are structured so that the user can work through them one by one after powering up the unit. After completing


these steps, the unit will be configured to the user's needs and properly functioning.



Starting with the measurement display ( 3-12), pressing any key **except** HOME will access the MAIN MENU; from here, follow these steps:

(If the display is showing anything other than the measurement display, press HOME to return to the measurement display first).

**Note!**

*If you are unfamiliar with the language set:  3-13 shows the sequence of keys to set a different language.*

*If the system has been set up accordingly, the code for access level 1 must be entered at this point to enable access to the following menu.*

**Note!**

*The factory setting for this unit is "no code required". For ease of operation, it is recommended to use the factory settings for access codes while setting up the unit for the first time. In the following sections, therefore, no more reference will be made to any need for entering a code.*

If need be, set the preferred language for the software.



3.8 Checking the Settings

3.8.1 Installed Options



| Installed Options 1of2 |      |
|------------------------|------|
| Licenses..             |      |
| Valves:                | None |
| Pumps:                 | None |
| DIO#1 installed:       | No   |
| DIO#2 installed:       | No   |
| Anal. Outputs:         | 4    |
| ▼AIN installed:        | No   |

| Installed Options 2of2 |  |
|------------------------|--|
| Flow..                 |  |
| Pressure..             |  |

| Licenses   |      |
|------------|------|
| Key 1:     | 0    |
| Key 2:     | 0    |
| Key 3:     | 0    |
| Package    | None |
| Trial Days |      |

All X-STREAM gas analyzers can be fitted with a variety of optional components: follow these steps to see which options are installed on your analyzer.

Press *LEFT* to return to SETUP, highlight "*Installed options*" and press *ENTER*.

**Do not edit any entries in these menus without special knowledge.**



**Incorrect entries may result in incorrect results or impair the performance of the unit.**

**Initial access to this menu should be to gain information on the configuration of the unit.**

This 2 pages menu indicates, which of the possible optional components are installed in the unit. The values displayed on your unit may differ from those illustrated here.

**Note!**  
*Multichannel instruments require to select a component (channel) to enter the second menu page.*

„Licenses..“ opens another menu where you can check or enter license codes to unlock optional software features.

3.8 Checking the Settings

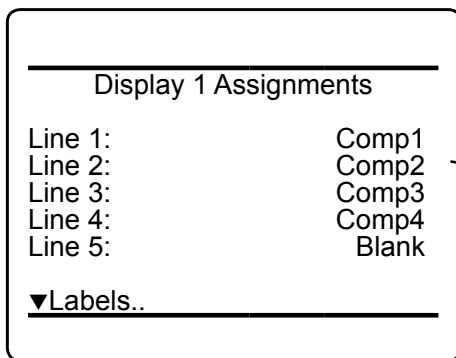
3.8.2 Configuring the Display



Press *LEFT* to return to SETUP.

Check the settings for the measurement display, temperature and pressure units, and for menu access: press *ENTER* to open DISPLAY.., select "*Measurement display..*" and press *ENTER*.

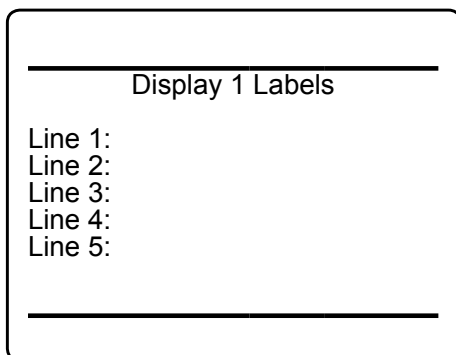
If a setting does not meet your requirements, access that menu and adjust the parameter.



Select the value to be displayed in each line of the measurement display. The following options are available:

- Comp1 ... Comp5,**
- Temp1 ... Temp5,**
- Press1 ... Press5,**
- Flow1 ... Flow5**
- Blank (nothing)**

**Note!**  
*X-STREAM* currently supports one pressure sensor only. Values **Press1** to **Press5** thus refer to the same sensor.

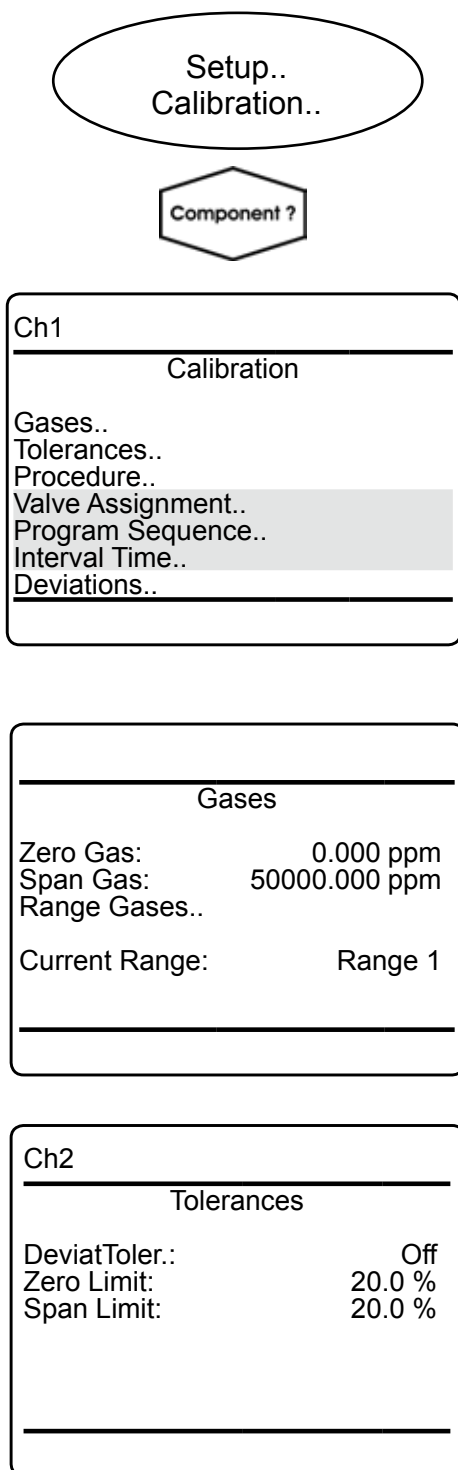


When entering LABELS.., you may change the channel's label, that is the first text phrase in a line showing a measurement value: If here nothing is entered, the default phrases (Ch1 ... Ch4) are used.

**Note!**  
 Notice the headlines of the menus showing a "1": This indicates that you can setup more than 1 measurement display page.

3.8 Checking the Settings

3.8.3 Calibration Setup



Once the display settings have been checked, press *LEFT* to return to SETUP and open CALIBRATION to check the calibration settings.

*Multi-channel unit:*  
 Select the component to be set in the gas component selection menu.

**Note!**  
 For more detailed information about calibration procedures, see X-STREAM XE instruction manual.

In CALIBRATION - GASES, enter the values for zero and span gas:

- See gas supplier's certificate for correct values.
- Values must be correctly set for results to be accurate.
- Multi-channel units: the values for each channel must be entered separately.

Press *LEFT* to return to CALIBRATION, and enter TOLERANCES .

By default the 'Deviation Tolerance check' option is set inactive (**Off**).

- With "*DeviatToler*" set to **On**,
- during calibration the analyzer checks whether the values set for zero and span gas conform to the concentration of the gas currently being supplied.
  - If the concentrations differ more than the percentage of range entered in the following lines, the calibration is aborted. This prevents calibration from being performed when the incorrect gas is supplied (e.g. span gas calibration using zero gas), which would result in an incorrectly configured unit.

3.8 Checking the Settings



Setup..  
 Measurement..

Ch1

---

Measurement 1of2

Ranges..  
 Damping..  
 Linearization..  
 Cross Interference..  
 Average..  
 Delay..  
 ▼

Ch1

---

▲ Measurement 2of2

Cut-off: None  
 Pressure Compensation ..


---

Press *LEFT* several times to return to SETUP and open MEASUREMENT.

Signal damping (set in DAMPING) allows smoothing the output signal, but also affects the response time of outputs and display:

- The factory setting is 0 seconds.
- The maximum possible  $t_{90}$  time is limited by the size of the internal sampling buffer and the sampling rates of the installed measuring principles/sensors.
- Multi-channel units: the value for each channel must be entered separately.

The last line enables the user

- to enter the current ambient pressure manually, if no pressure sensor is installed, or
- to view the current pressure, if a sensor is installed (  INSTALLED OPTIONS).

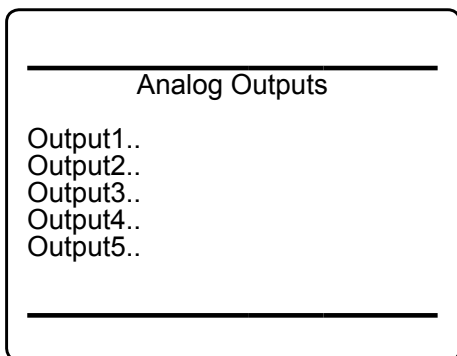
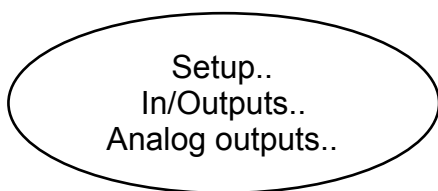
If no pressure sensor is installed, enter the current ambient pressure here and adjust it, when significant changes take place: this improves the accuracy of the instrument.

3.8 Checking the Settings

3.8.4 Setting the Analog Outputs




Press *LEFT* to return to SETUP, and then open IN/OUTPUTS. and from there enter ANALOG OUTPUTS.

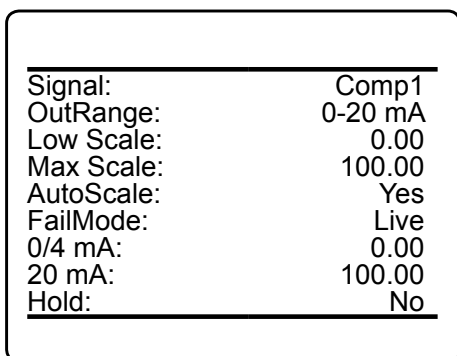


Select the analog output you like to check.

**Note!**

*The following section only in brief describes the entries currently of interest!*

 *X-STREAM XE instruction manual, Chapter 6 for a more detailed description.*



"Signal" specifies the value associated with the selected output. The following options (partly dependent on the number of measuring channels and sensors installed) are available:

## 3.8 Checking the Settings

| Signal <sup>*)</sup> | Description  |
|----------------------|--|
| None                 | The analog output is deactivated   |
| 0 mA                 | A 0 or 4 mA signal is generated, e.g. to check the signal processing in an external system. Whether a 0 or 4 mA signal is generated, is set by the "Out range" line (👉 next page). |
| 20 mA                | A 20 mA signal is generated, e.g. to check the signal processing in an external system.  |
| Comp1 ... 5          | Gas concentration  |
| Temp1 ... 5          | Temperature  |
| Press1 ... 5         | Pressure   |
| Flow1 ... 5          | Flow   |
| CalcA ... D          | Result of calculator   |
| RawVal1 ... 5        | Raw value  |
| RangeID1 ... 5       | ID of selected range   |

*\*) Numbers 1 to 5 refer to components [channels] 1 to 5: In case of secondary parameters, this means, the selected value is that of the sensor assigned to the given component (Press2 is the pressure value of the sensor assigned to component 2).*

*In contrast, capital letters A to D imply that these calculator results are component [channel] independent (Calc C is the result of calculator C).*

3.8 Checking the Settings

|            |         |
|------------|---------|
| Signal:    | Comp1   |
| OutRange:  | 0-20 mA |
| Low Scale: | 0.00    |
| Max Scale: | 100.00  |
| AutoScale: | Yes     |
| FailMode:  | Live    |
| 0/4 mA:    | 0.00    |
| 20 mA:     | 100.00  |
| Hold:      | No      |

Next, select the output range:

- **0-20 mA** (dead zero) generates a 20 mA signal, if a concentration is measured at the upper limit of the signal range. A 0 mA signal is generated if the sample gas concentration equals the value specified with "LowScale" .
- **4-20 mA** (life zero): A 4 mA signal is generated if the concentration equals the value specified with "Low Scale", thus enabling to detect e.g. a broken cable.

If „Signal“ is assigned a concentration signal , and „Auto scale“ is set to **No**, in the next lines enter the concentrations to output 0/4 mA („Low scale“) or 20 mA („High scale“).

If either „Auto scale“ is **Yes**, or „Signal“ not assigned a concentration signal, the levels are set with default values and not editable.

"FailMode" selects the output's behaviour under failure conditions, considering or not, the NAMUR recommendation NE 43.

Available options:

**Track:** NE 43 not considered; output always correlates with the measured value.

**HIGH + 10%:** NE 43 failure signal level: 'above'.

**LOW - 10%:** NE 43 failure signal level: 'below'.

Further information on NE 43 is provided on the next page.

3.8 Checking the Settings

Operation Modes acc. NAMUR NE 43

If "OutRange" is set to **0-20 mA**, a 20 mA signal is generated, if the measured concentration is equal to "Max Scale". A 0 mA signal is generated if the sample gas concentration is 0 (dead zero).

However, a severed cable also results in a signal value of 0. An external data acquisition system thus cannot detect such an failure and accepts a gas concentration of 0.

The commonly used method of detecting a severed cable is to apply an offset: a concentration corresponding to the lower range value is assigned an analog signal of 4 mA, enabling to detect a severed or disconnected cable.

This live zero mode is activated by setting "Out Range" to **4-20 mA**.

Operation modes conforming to NAMUR 43 (NE 43) recommendations

The operation modes described above do not generate a signal which enables detection of a failure in the measurement system. In such cases the behaviour of the output signal is undefined: either the last value is held, or a random

value is sent. System failures thus cannot be detected by an external data acquisition system.

NE 43 contains recommendations for setting analog outputs in order to avoid these situations. These are implemented by X-STREAM analyzers as follows:

Setting "FailMode" to **HIGH + 10%** or **LOW - 10%** defines specific analog output signals in case of a failure. Since these values do not occur under normal operation conditions, a data acquisition system is enabled to distinguish between the following situations (table 3-1):

- Valid signal (signal within valid range; column C)
- Signal out of range (signal rises or falls slowly to the limits given in columns D or E and holds this value until the concentration returns to a valid level).
- Failure (signal out of range; column F)
- Severed cable (no signal; column G)

| Column     | Output signal, if |                                 |                         |   |  |                              |                  |
|------------|-------------------|---------------------------------|-------------------------|---|--|------------------------------|------------------|
|            | A                 | B                               | C                       | D   | E  | F                            | G                |
| "OutRange" | "FailMode"        | Failure signal level acc. NE 43 | Measured value is valid | Measured value is below lower limit ("Low scale") | Measured value is above upper limit ("High scale") | An internal failure occurred | Cable is severed |
| 0-20 mA    | Track             | -                               | 0 ... 20 mA             | < -19 mA  | > 21 mA  | undefined                    | 0 mA             |
| 4-20 mA    | Track             | -                               | 4 ... 20 mA             | < -19 mA  | > 21 mA  | undefined                    | 0 mA             |
| 0-20 mA    | LOW - 10%         | below                           | 0 ... 20 mA             | -0.2 mA   | 20.5 mA  | -2 mA                        | 0 mA             |
| 4-20 mA    | LOW - 10%         | below                           | 4 ... 20 mA             | 3.8 mA  | 20.5 mA  | 2.4 mA                       | 0 mA             |
| 0-20 mA    | HIGH + 10%        | above                           | 0 ... 20 mA             | -0.2 mA   | 20.5 mA  | > 22 mA                      | 0 mA             |
| 4-20 mA    | HIGH + 10%        | above                           | 4 ... 20 mA             | 3.8 mA  | 20.5 mA  | > 21.6 mA                    | 0 mA             |

Tab. 3-1: Analog output signals settings and operational modes



### 3.8 Checking the Settings

|            |         |
|------------|---------|
| Signal:    | Comp1   |
| OutRange:  | 0-20 mA |
| Low Scale: | 0.00    |
| Max Scale: | 100.00  |
| AutoScale: | Yes     |
| FailMode:  | Live    |
| 0/4 mA:    | 0.00    |
| 20 mA:     | 100.00  |
| Hold:      | No      |

"0/4 mA" and „20 mA“ enable to finetune the analog output to compensate possible deviations based on electronics tolerances:

- Set "Signal" to **0 mA or 20 mA**
- measure the output current,
- adjust it to the expected value.

Accepted range: **-10,000 ... +10,000**

"Hold" selects the output's behaviour during calibrations.

If set to **Yes**,

- the analog output is fixed to the last measured value;
- concentration alarms, which may otherwise be triggered by the concentrations of the calibration gases, are suppressed.

If set to **No**,

- the analog output signal always corresponds to the actual measured value during calibration; this may trigger alarms if limits are exceeded.

**Note!**

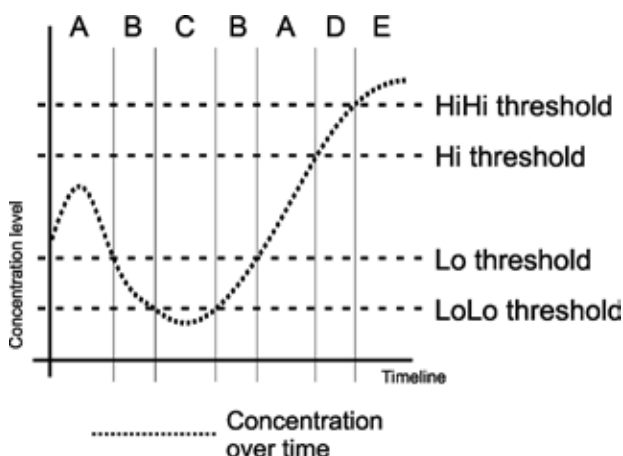
*This behaviour may be undesirable if e.g. the unit is connected to a data acquisition system.*

**3.8 Checking the Settings**

**3.8.5 Setting Concentration Alarms**



|                |             |
|----------------|-------------|
| Ch1            |             |
| Concentration  |             |
| Alarm Monitor: | On          |
| LoLo Level:    | 50.000 ppm  |
| Lo Level:      | 100.000 ppm |
| Hi Level:      | 400.000 ppm |
| HiHi Level:    | 600.000 ppm |
| Hysteresis:    | 10.000 ppm  |
| States..       |             |



**Fig. 3-3:** Arrangement of concentration thresholds

**Note!**

If concentration alarms are not being used, continue with 3-25.

Press *LEFT* until SETUP is displayed, then open ALARMS - CONCENTRATION

*Multi-channel unit:*

Select the channel to be setup in *SELECT COMPONENT*.

Four concentration limits can be set for each channel:

- "Lo" and "Hi" enframe the expected gas concentration,
- "LoLo" equals or is below "Lo",
- "HiHi" equals or is above "Hi".

See the figure to the left for an explanation. If you enter values for any threshold, the above given order has to be considered. A message is displayed, if an entered value does not comply with this condition.

Should the measured concentration go beyond one of the threshold levels (areas B, C, D & E in the figure), a message is displayed in the message line of the measurement display, the NAMUR pictogram appears (bell) and a corresponding digital output is activated, if assigned.

A hysteresis avoids oscillating alarms in case the concentration is fluctuating around a threshold.

**3.8 Checking the Settings**

|                      |            |
|----------------------|------------|
| Ch1                  |            |
| Concentration Alarms |            |
| LoLo Alarm:          | Off        |
| Lo Alarm             | On         |
| Hi Alarm             | Off        |
| HiHi Alarm           | Off        |
| Concentration        | 75.000 ppm |

You may turn the alarm function **On** or **Off** separately for each channel ("*Alarm monitor*"). In case of an alarm, you may like to enter the STATES submenu, to check which one is triggered.

**3.8.6 Backup the Settings**



|                       |  |
|-----------------------|--|
| Save-Load             |  |
| Local Backup..        |  |
| Factory Defaults..    |  |
| USB Backup..          |  |
| USB Firmware Update.. |  |

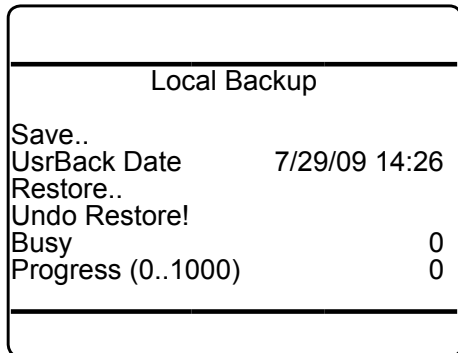
The most important settings have now been checked and the unit is configured to suite your needs.

A backup copy of these configuration data can now be saved.

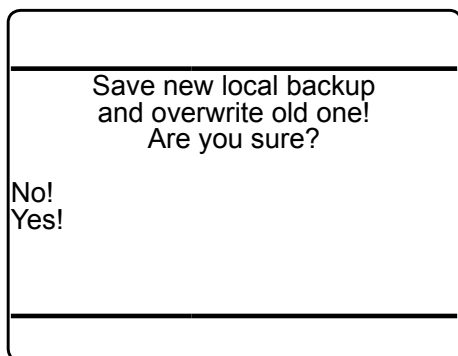
Press *LEFT* until SETUP and then open SAVE-LOAD.

- This menu gives you the choice, to either
- make a local backup to a protected memory area
  - restore the factory default settings, or
  - make a backup to an external USB device.

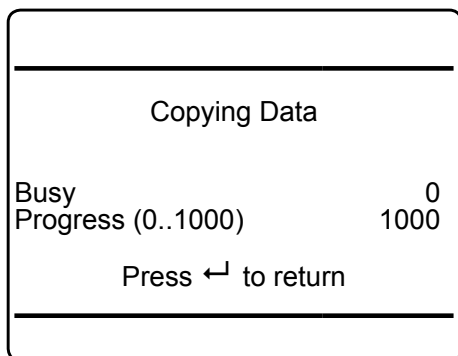
3.8 Checking the Settings



For now, make a local backup:  
 Enter LOCAL BACKUP and then select "Save..".



Confirm the operation (select "Yes!").



Wait until "*Progress (0..1000)*" shows **1000**, then press *ENTER* to return to LOCAL BACKUP.




**Congratulations!**  
 You've now successfully completed checking the unit's setup!  
 • Press *HOME* to return to the **MEASUREMENT DISPLAY**.

3.9 Perform a Calibration

3.9 Perform a Calibration

We recommend to perform at least a zero calibration, after startup of the instrument, to ensure proper measuring results.


The following steps describe, how to perform a manual calibration. If your instrument features a valve block,  X-STREAM XE instruction manual for a comprehensive description of calibration procedures.

Before performing any actions, make sure the required calibration gas is applied and flowing!



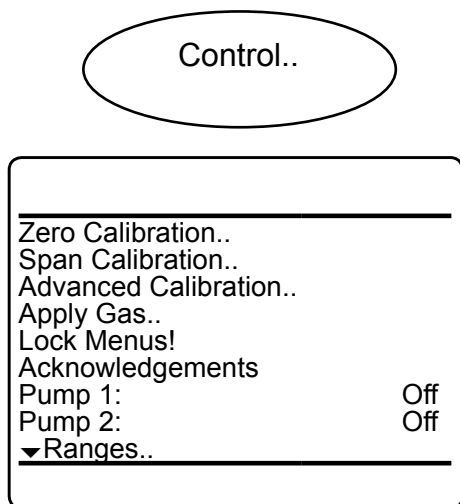
Supply all calibration gases with the same flow as the sample gas (recommended approx. 1 l/min), pressureless and utilizing the correct gas fitting.

Ensure the warm-up time after switching on has elapsed!  
Warm-up time is 15 to 50 minutes depending on installed measuring system and configuration!

|  |  |
|--|--|
|  |  <b>CAUTION</b>   |
|  | <p><b>OPERATION AT LOW TEMPERATURES</b></p> <p>When operating an instrument at temperatures below 0 °C (32 °F), do NOT apply gas nor operate the internal pump before the warmup time has elapsed!</p> <p>Violation may result in condensation inside the gas paths or damaged pump diaphragm!</p> |

## 3.9.1 Manual Calibration

### 3.9.1 Manual Zero Calibration



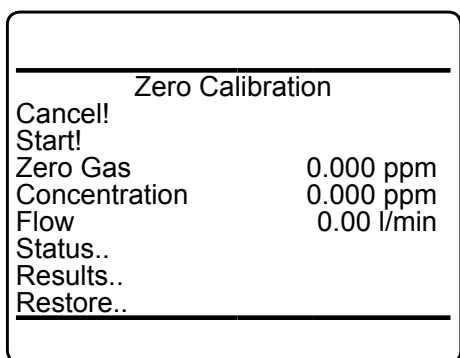
Starting from the MEASUREMENT SCREEN press *DOWN* to open the MAIN MENU and enter CONTROL.

To start a zero calibration select the first line:



*Multi-channel unit:*  
 Select the channel to be calibrated in **SELECT COMPONENT**.

The first line gives you the choice to cancel the procedure now.



Select the second line to **start the calibration**.

The next lines show

- the calibration gas setup (here: required zero gas concentration is 0.000 ppm),
- the currently measured gas concentration
- the current gas flow.

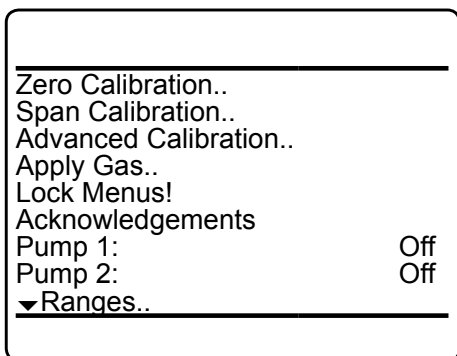
When finished press *LEFT* several times to return to **either**

**SELECT COMPONENT** (multi channel analyzer only), to perform a zero calibration for another channel,

**or**  
 to **CONTROL**, where you may start a span calibration. The procedure and screens look similar to those of a zero calibration:

3.9 Manual Calibration

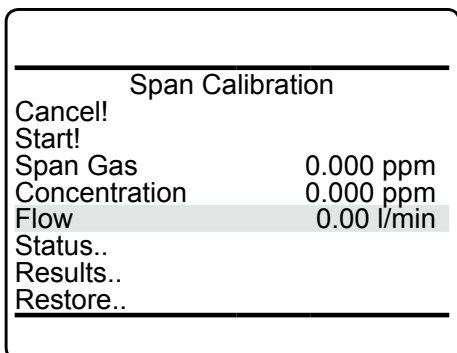
3.9.2 Manual Span Calibration



Select "Span Calibration.."



Multi-channel unit:  
 Select the channel to be calibrated in  
 SELECT COMPONENT.



**Before selecting any further line make sure the required calibration gas is applied and flowing!**

Span calibration offers the same options as zero calibration.

When finished, press *LEFT* several times to return to SELECT COMPONENT (multi channel analyzer only), to perform a span calibration for another channel,

**or**

press *HOME* to return to the MEASUREMENT SCREEN, to finish with manual calibration procedures.





## Appendix

This chapter contains

Block diagram



page A-2

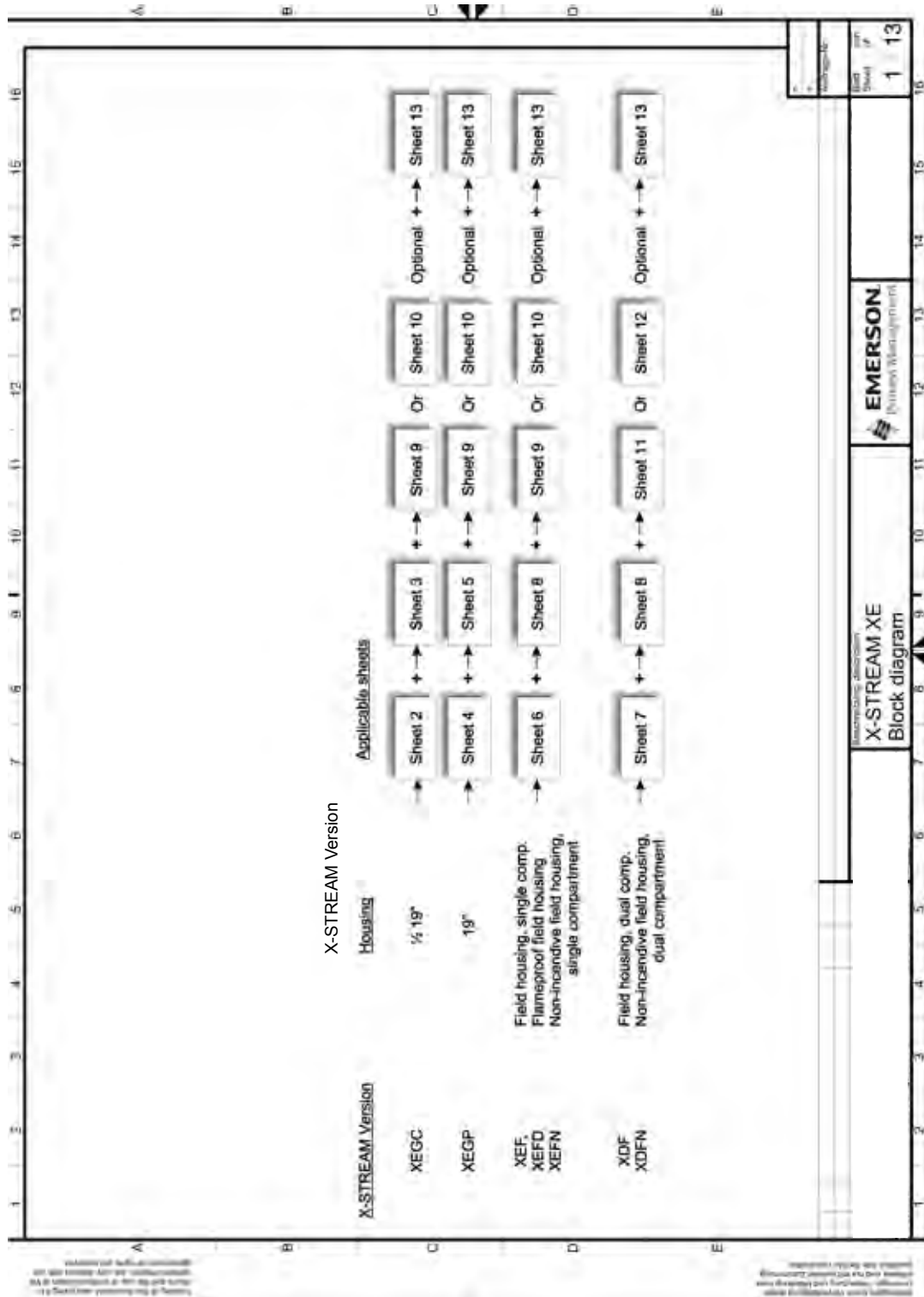
Assignment of Terminals and Sockets



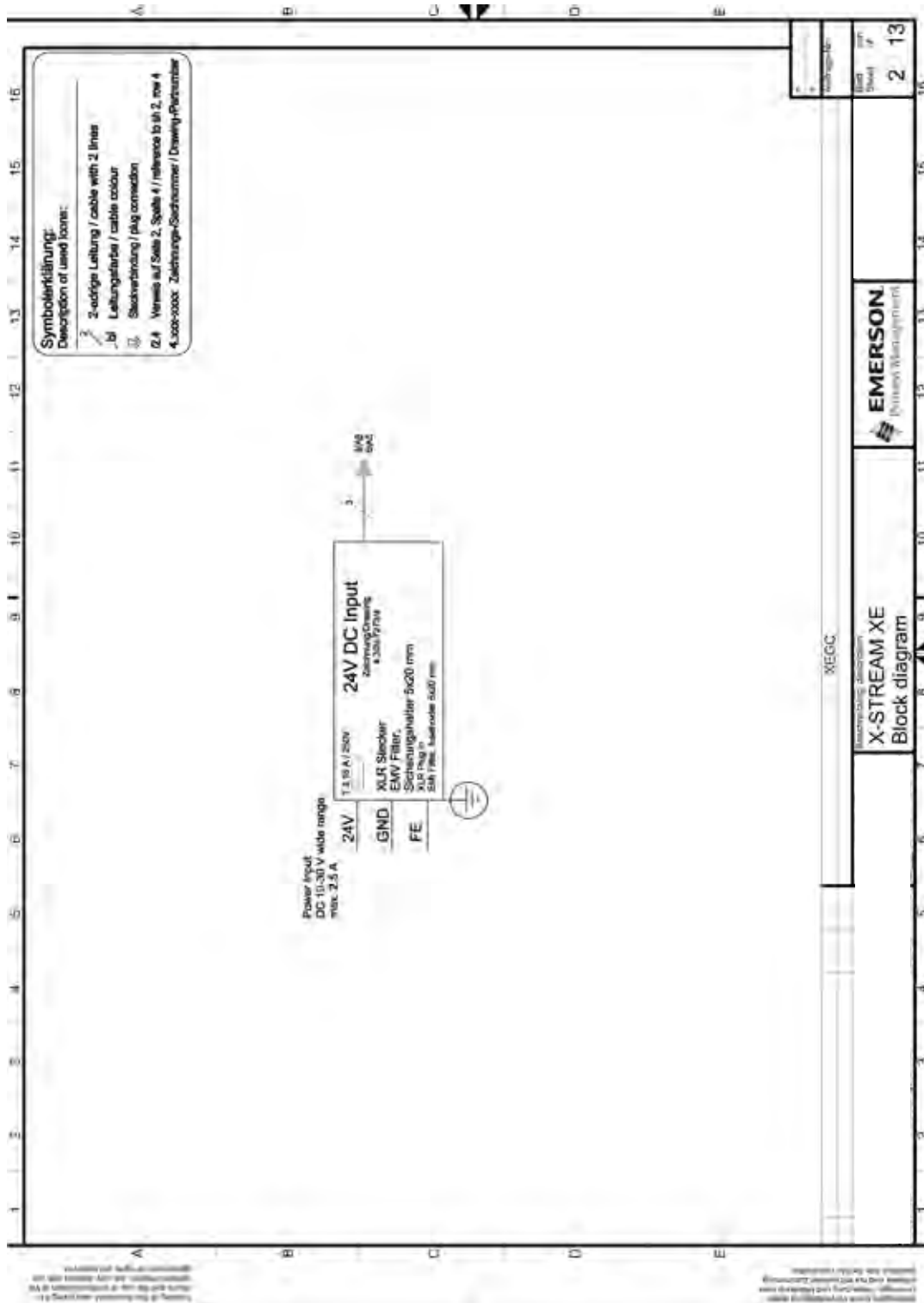
page A-15

## A.1 Block Diagram

### A.1 Block Diagram

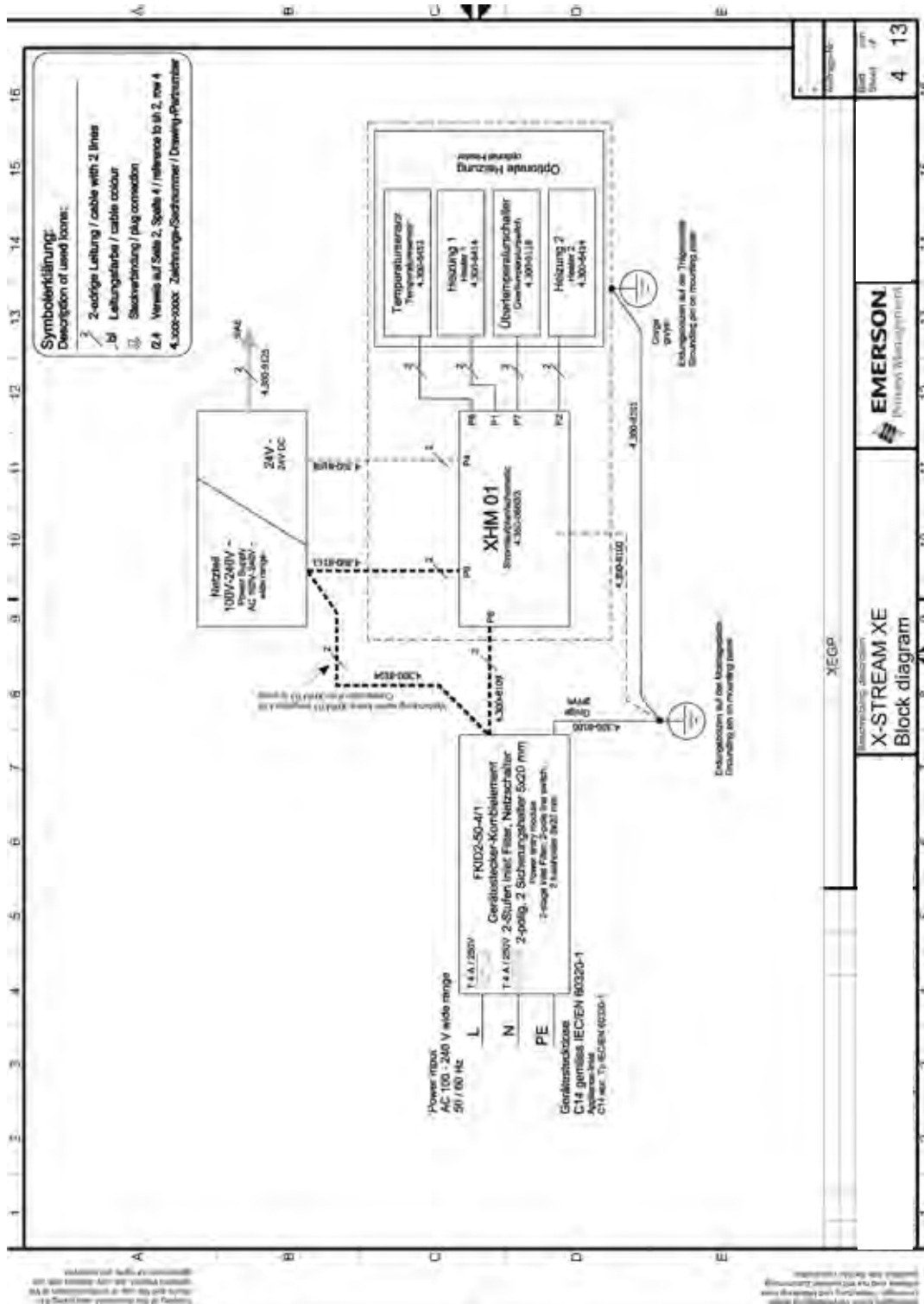


**A.1 Block Diagram**

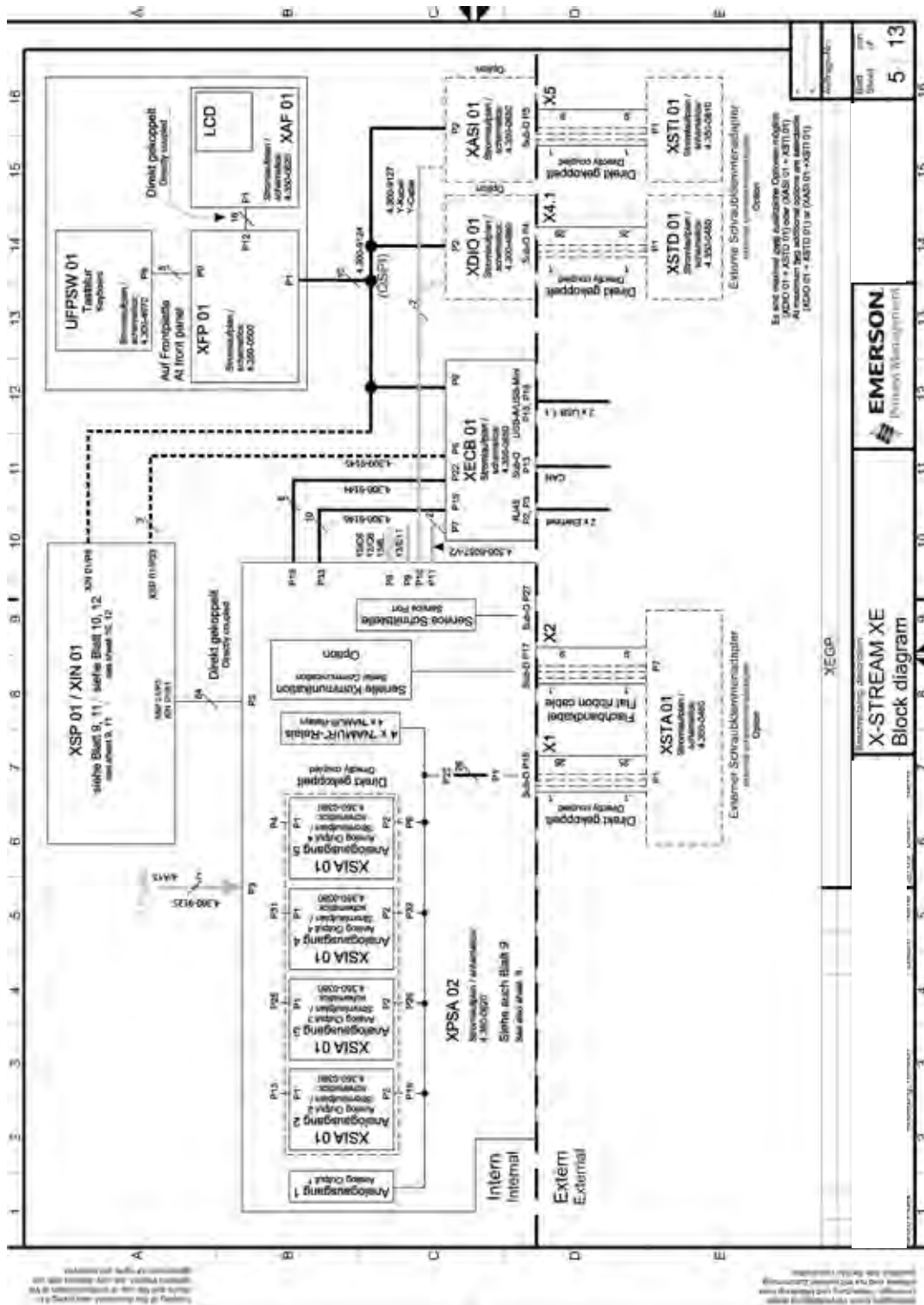




A.1 Block Diagram



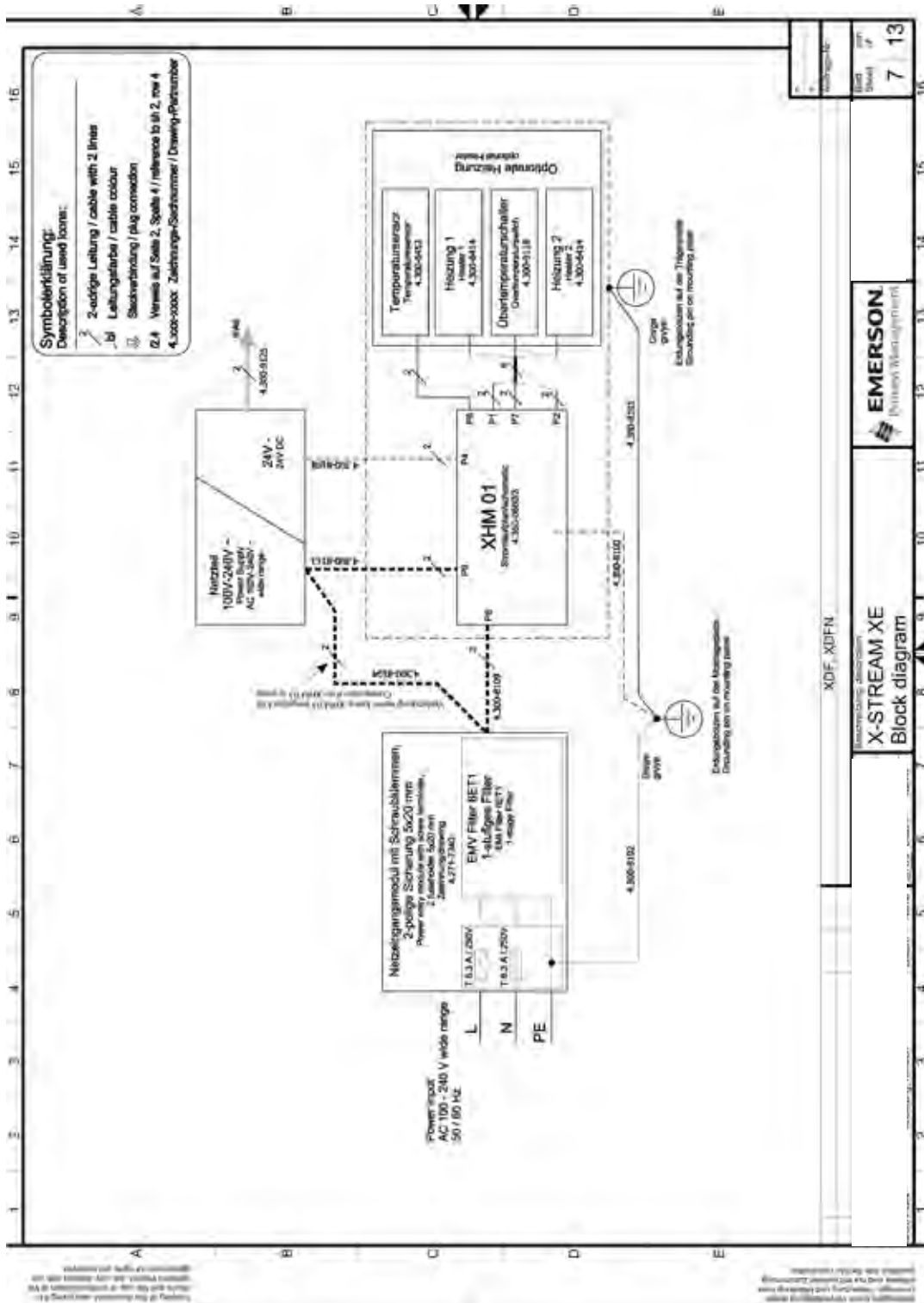
## A.1 Block Diagram





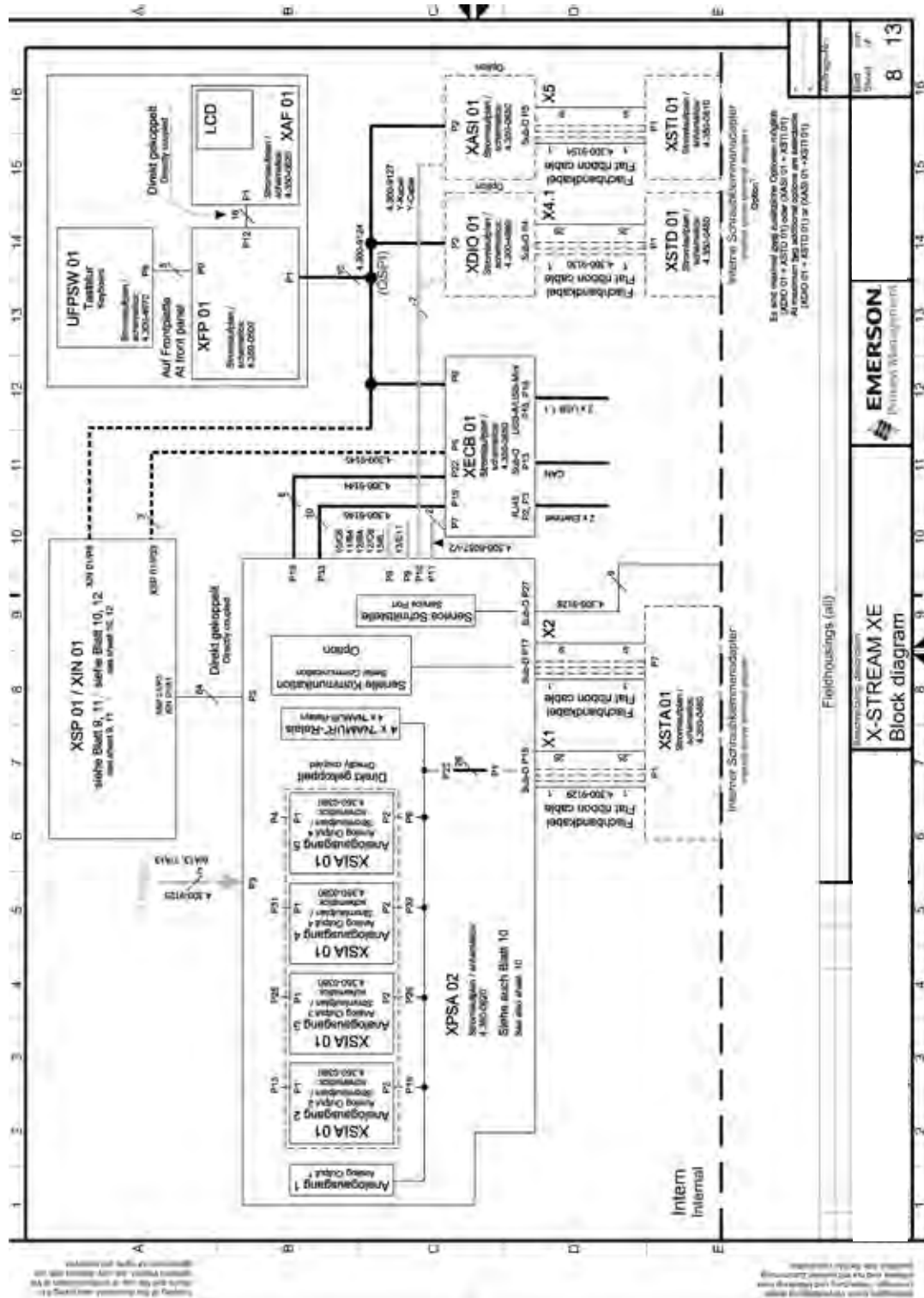


## A.1 Block Diagram

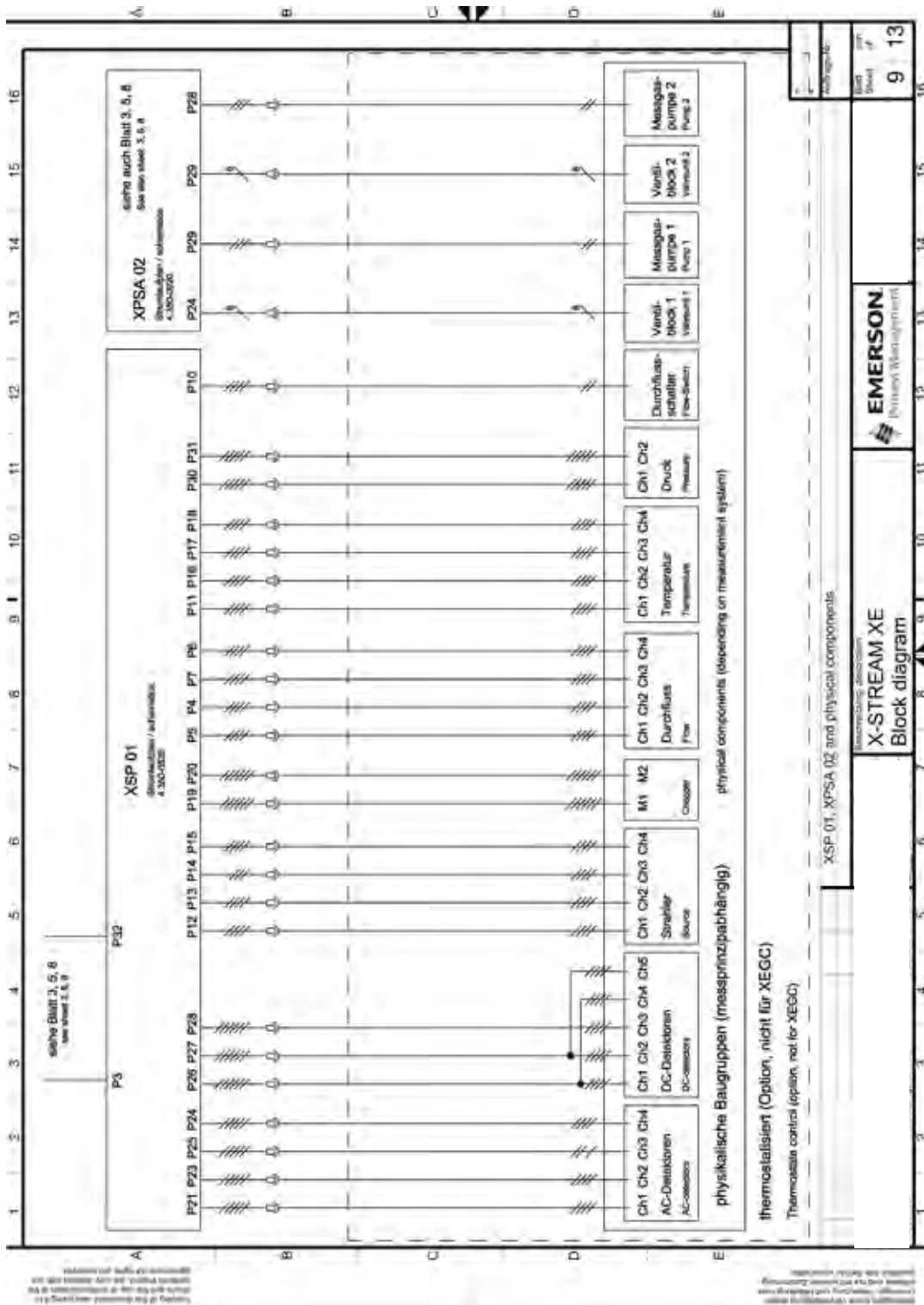




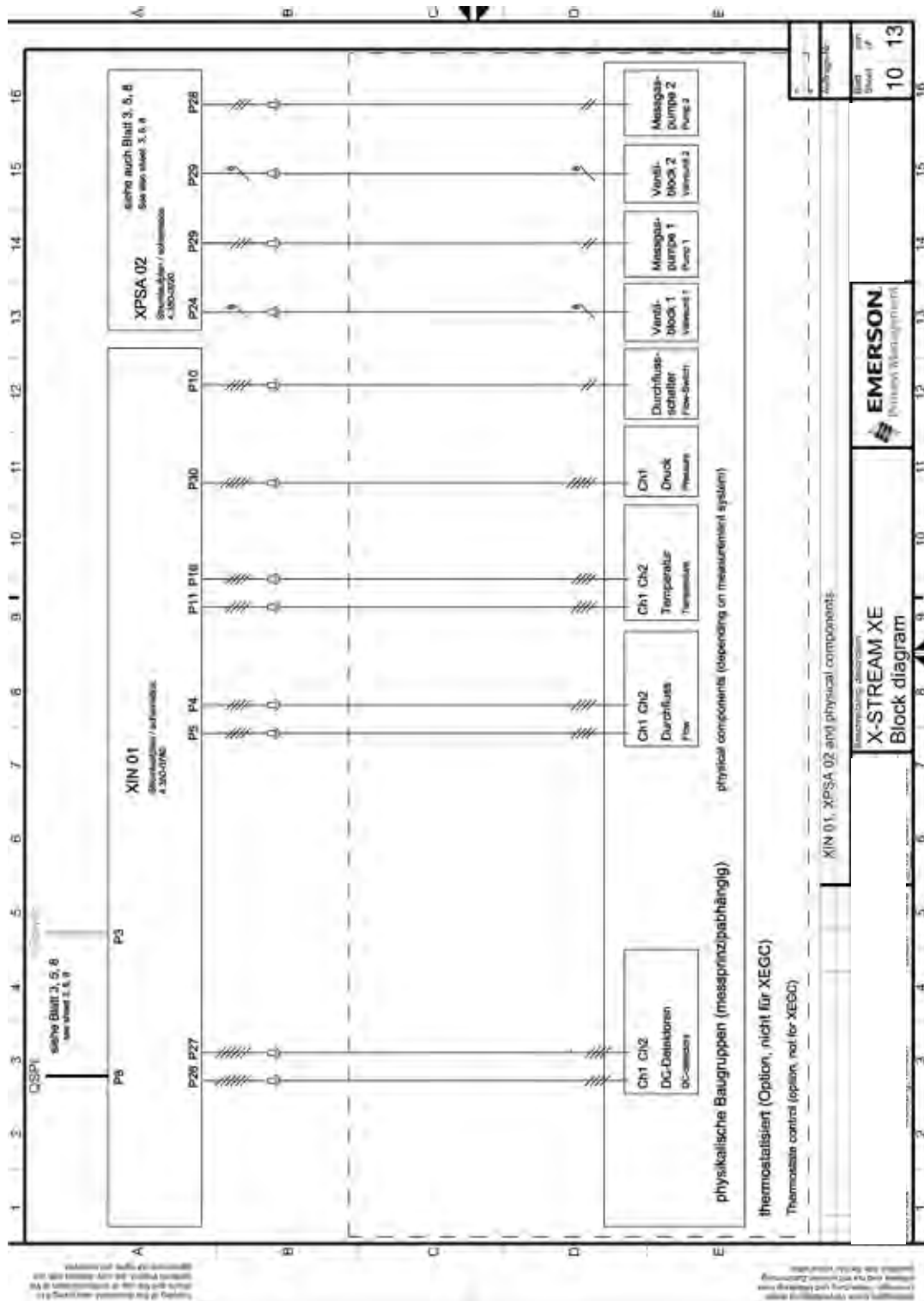
A.1 Block Diagram



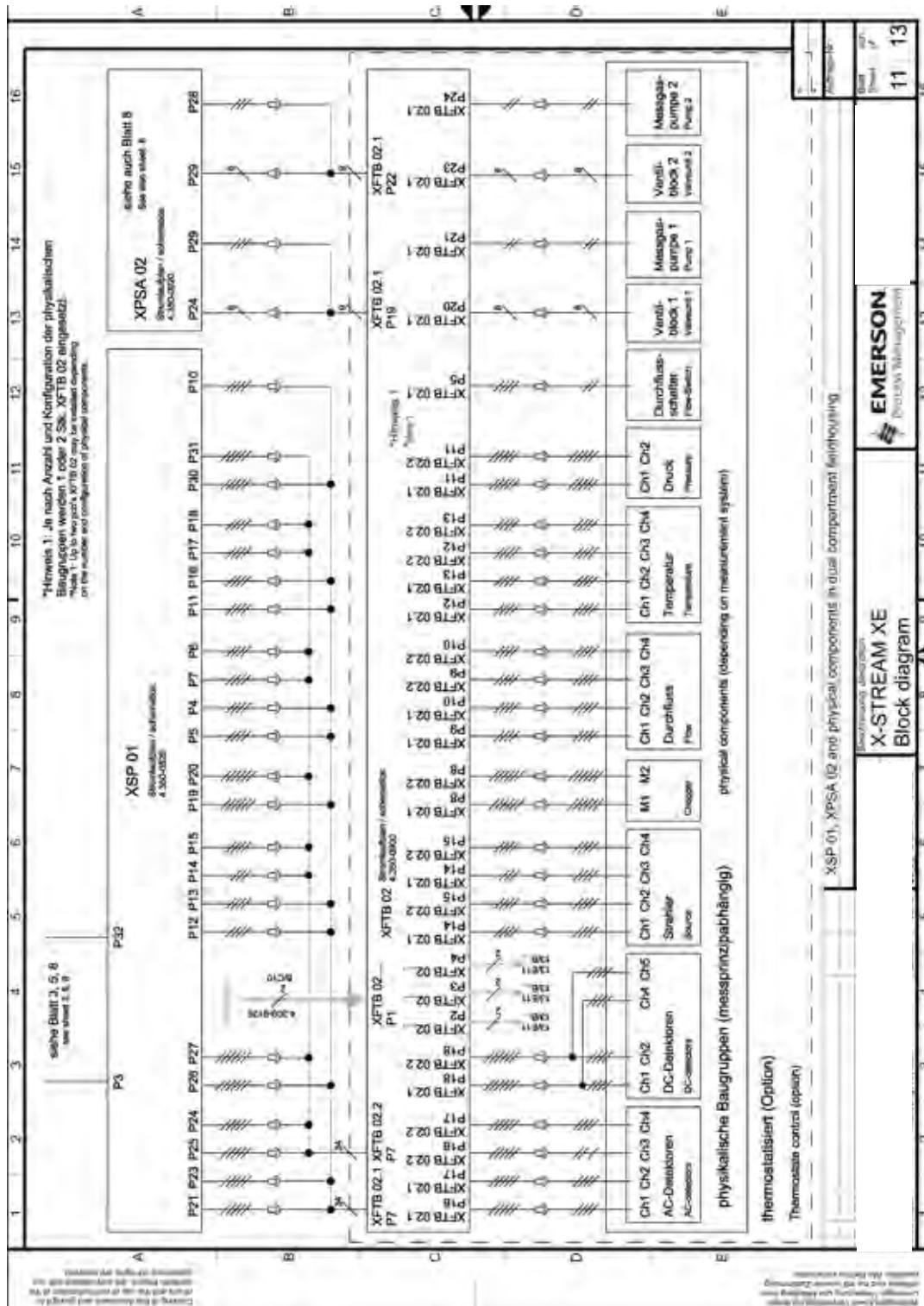
## A.1 Block Diagram



A.1 Block Diagram

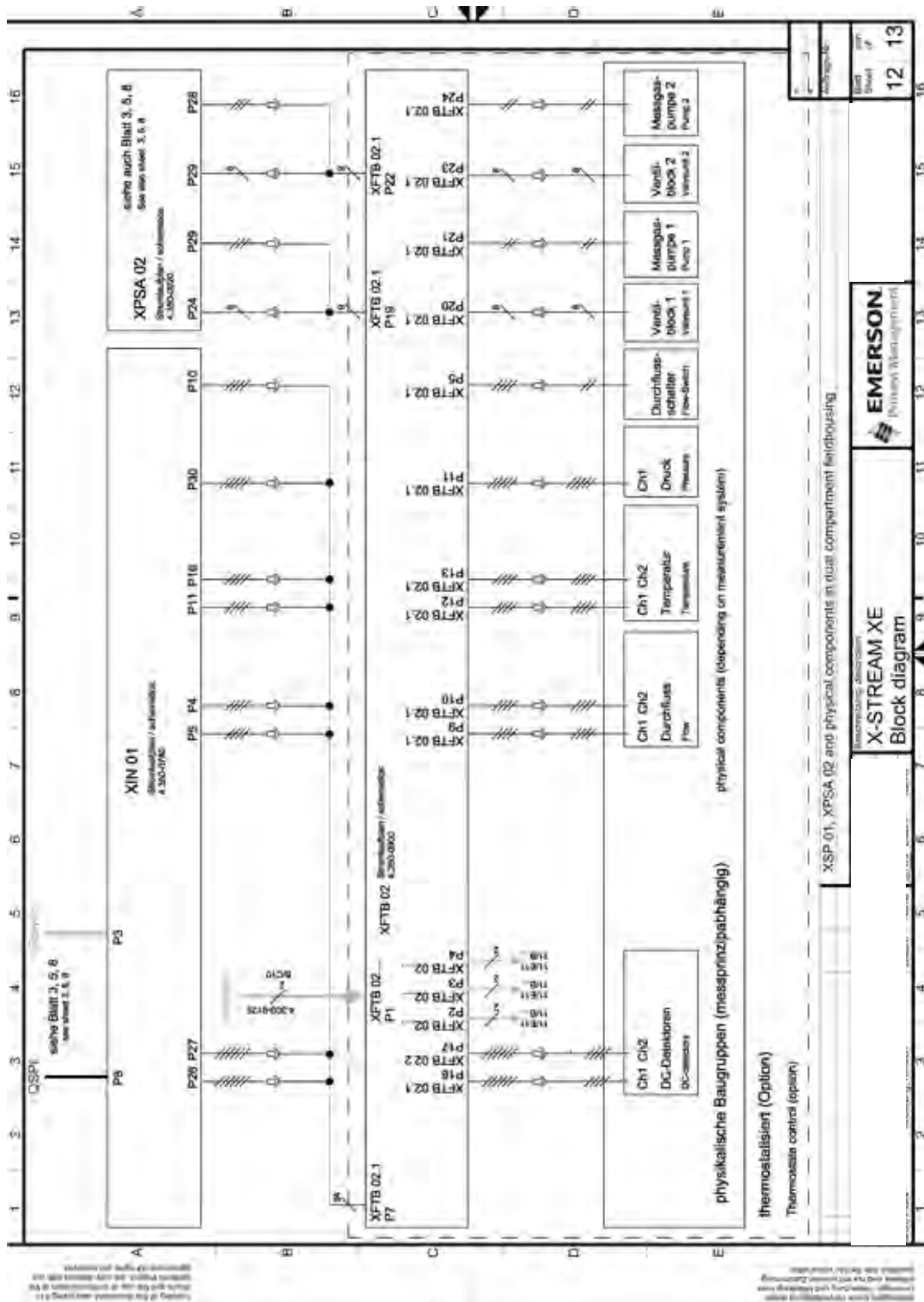


## A.1 Block Diagram





A.1 Block Diagram





A.2 Assignment of Terminals and Sockets

A.2 Assignment of Terminals and Sockets

A.2.1 Tabletop & Rack Mount Analyzers

| Signal                       | Pin |
|------------------------------|-----|
| Channel 1, (+) 4 (0) - 20 mA | 1   |
| Channel 2, (+) 4 (0) - 20 mA | 2   |
| Channel 3, (+) 4 (0) - 20 mA | 3   |
| Channel 4, (+) 4 (0) - 20 mA | 4   |
| Channel 5, (+) 4 (0) - 20 mA | 5   |
| unused                       | 6   |
| unused                       | 7   |
| Output1 (Failure) NC         | 8   |
| Output1 (Failure) NO         | 9   |
| Output1 (Failure) COM        | 10  |
| Output3 (Off spec) NC        | 11  |
| Output3 (Off spec) NO        | 12  |
| Output3 (Off spec) COM       | 13  |

| Pin | Signal                            |
|-----|-----------------------------------|
| 14  | Channel 1, GND                    |
| 15  | Channel 2, GND                    |
| 16  | Channel 3, GND                    |
| 17  | Channel 4, GND                    |
| 18  | Channel 5, GND                    |
| 19  | unused                            |
| 20  | Output2 (Maintenance request) NC  |
| 21  | Output2 (Maintenance request) NO  |
| 22  | Output2 (Maintenance request) COM |
| 23  | Output4 (Function check) NC       |
| 24  | Output4 (Function check) NO       |
| 25  | Output4 (Function check) COM      |

**Note!**  
Configuration of relay contacts as per standard factory setting (NAMUR status signals)

Socket X1 - Analog outputs, relay outputs 1...5  
(Assignment of screw terminals adaptor: see XSTA on next page)

| Signal                     | Pin |
|----------------------------|-----|
| Input 1                    | 1   |
| Input 2                    | 2   |
| Input 3                    | 3   |
| Input 4                    | 4   |
| GND for all digital inputs | 5   |
| unused                     | 6   |
| unused                     | 7   |
| Output 5 NC                | 8   |
| Output 5 NO                | 9   |
| Output 5 COM               | 10  |
| Output 6, NC               | 11  |
| Output 6, NO               | 12  |
| Output 6, COM              | 13  |
| Output 7, NC               | 14  |
| Output 7, NO               | 15  |
| Output 7, COM              | 16  |
| Output 8, NC               | 17  |
| Output 8, NO               | 18  |
| Output 8, COM              | 19  |

| Pin | Signal         |
|-----|----------------|
| 20  | Input 5        |
| 21  | Input 6        |
| 22  | Input 7        |
| 23  | Output 9, NC   |
| 24  | Output 9, NO   |
| 25  | Output 9, COM  |
| 26  | Output 10, NC  |
| 27  | Output 10, NO  |
| 28  | Output 10, COM |
| 29  | Output 11, NC  |
| 30  | Output 11, NO  |
| 31  | Output 11, COM |
| 32  | Output 12, NC  |
| 33  | Output 12, NO  |
| 34  | Output 12, COM |
| 35  | Output 13, NC  |
| 36  | Output 13, NO  |
| 37  | Output 13, COM |

**Note!**  
The configuration illustrated here is that of the first socket, labelled X4.1.  
Inputs 8-14 and outputs 14-22, are on the second socket (X4.2), if installed.

Socket X4 - Digital I/O  
(Assignment of screw terminals adaptor: see XSTD on next page)

| Pin no. | MOD 485/ 2 wire | MOD 485/ 4 wire | RS 232   |
|---------|-----------------|-----------------|----------|
| 1       | Common          | Common          | Common   |
| 2       | not used        | not used        | RXD      |
| 3       | not used        | not used        | TXD      |
| 4       | not used        | RXD1(+)         | not used |
| 5       | D1(+)           | TXD1(+)         | Common   |
| 6       | not used        | not used        | not used |
| 7       | not used        | not used        | not used |
| 8       | not used        | RXD0(-)         | not used |
| 9       | D0(-)           | TXD0(-)         | not used |

Connector X2 - IOIOI - Serial Modbus interface  
(Assignment of screw terminals adaptor: see XSTA on next page)

| Signal   | Pin |
|--|-----|
| BR 2 {fit a wire bridge here to apply analog signal in current mode to input 2 <sup>*)</sup> | 5   |
| BR 2 {signal in current mode to input 2 <sup>*)</sup>  | 4   |
| unused   | 3   |
| BR 1 {fit a wire bridge here to apply analog signal in current mode to input 1 <sup>*)</sup> | 2   |
| BR 1 {signal in current mode to input 1 <sup>*)</sup>  | 1   |

| Pin | Signal           |
|-----|------------------|
| 9   | Input 2 high (+) |
| 8   | Input 2 low (-)  |
| 7   | Input 1 low (-)  |
| 6   | Input 1 high (+) |

<sup>\*)</sup> alternatively set jumper P1 on electronics board XASI  
<sup>\*\*)</sup> alternatively set jumper P2 on electronics board XASI

Connector X5 - Analog inputs  
(Assignment of screw terminals adaptor: see XSTI on next page)

24 V max. 2,5 A

1: ME  
2: + 24 V  
3: 0 V (⊥)

DC 24 V Input (1/2 19" analyzer)

| Pin no. | Signal   |
|---------|----------|
| 1       | TX+      |
| 2       | TX-      |
| 3       | RX+      |
| 6       | RX-      |
| other   | not used |

Ethernet connector for Modbus

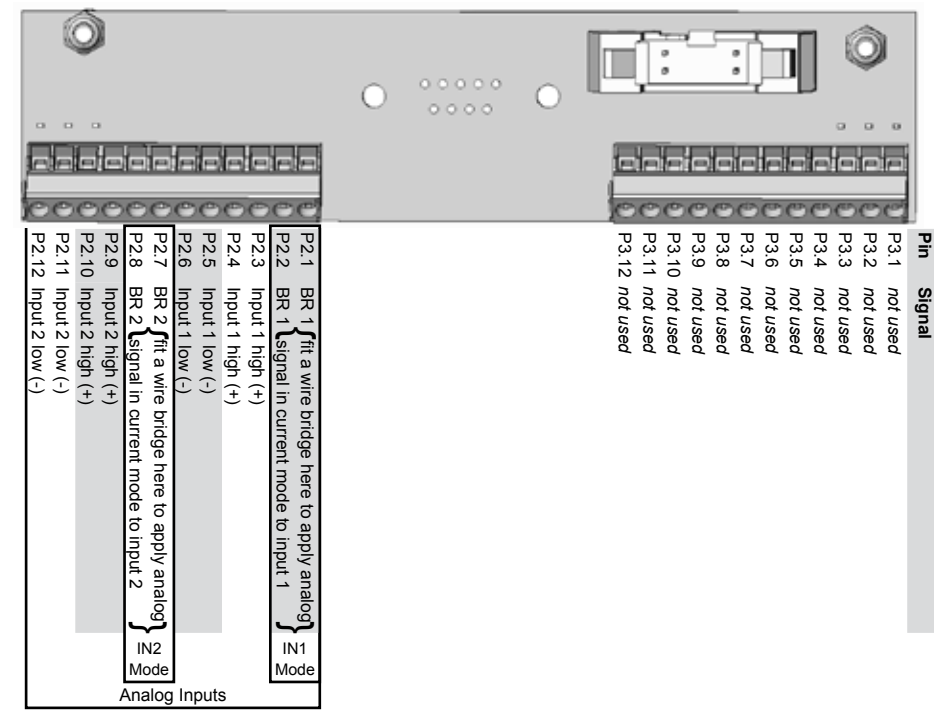
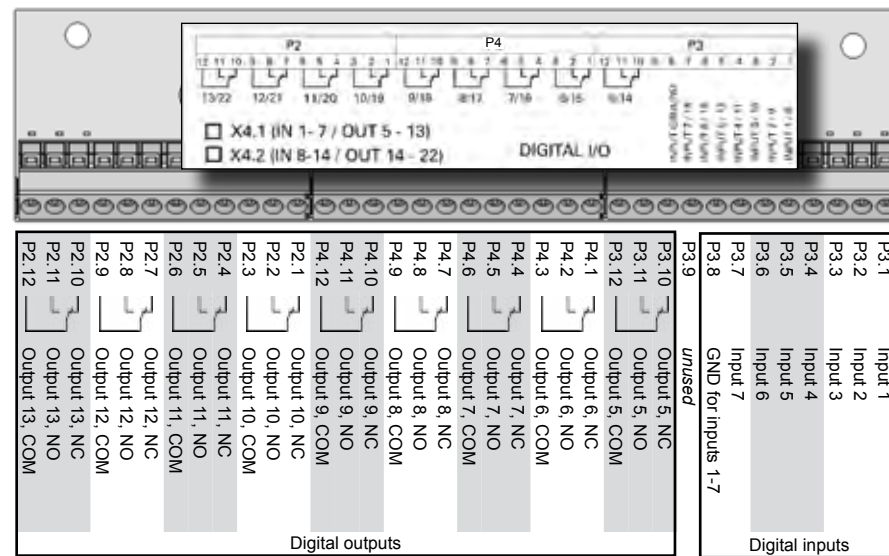
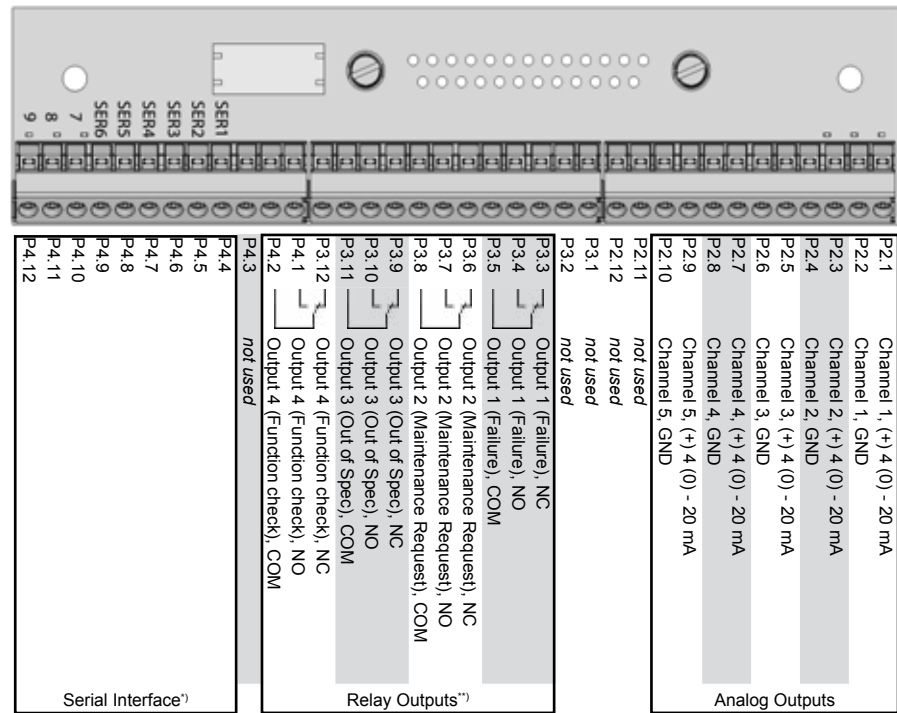
A.2 Assignment of Terminals and Sockets

A.2.2 Field Housings

XSTA: Standard strip with standard and optional signals

XSTD: Optional strips with 7 Dig Inputs and 9 Dig Outputs each

XSTI: Analog inputs



**Note!**  
The configuration illustrated here is that of the first adapter (X4.1).  
Inputs 8-14 and outputs 14-22, if available, are on the second adapter (X4.2).

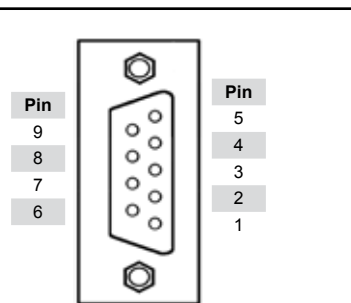
\*) See table below

\*\*) Configuration of relay output terminals as per standard factory setting (NAMUR status signals)

Assignment of serial interface terminals

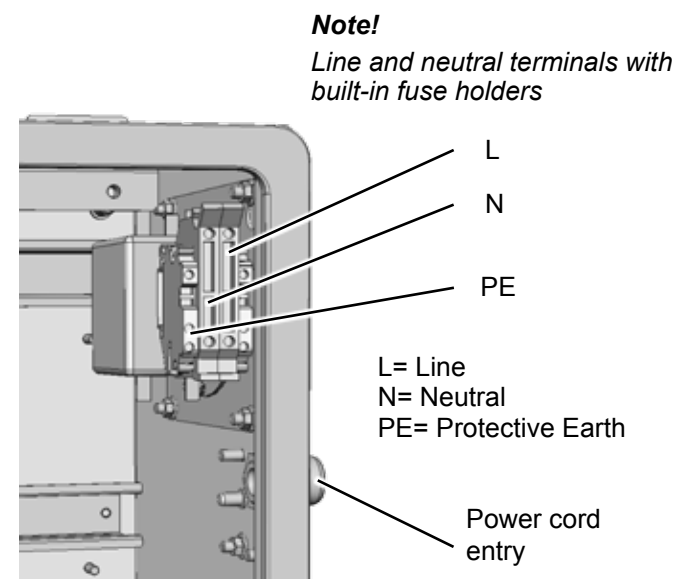
| Terminal | MOD 485/ 2 wire | MOD 485/ 4 wire | RS 232   |
|----------|-----------------|-----------------|----------|
| P4.4     | SER1            | Common          | Common   |
| P4.5     | SER2            | not used        | RXD      |
| P4.6     | SER3            | not used        | TXD      |
| P4.7     | SER4            | not used        | RXD1(+)  |
| P4.8     | SER5            | D1(+)           | TXD1(+)  |
| P4.9     | SER6            | not used        | not used |
| P4.10    | 7               | not used        | not used |
| P4.11    | 8               | not used        | RXD0(-)  |
| P4.12    | 9               | D0(-)           | TXD0(-)  |

Signal Terminals Strips

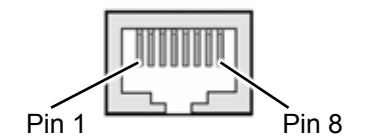


| Pin no. | RS 232   |
|---------|----------|
| 1       | Common   |
| 2       | RXD      |
| 3       | TXD      |
| 4       | not used |
| 5       | Common   |
| 6       | not used |
| 7       | not used |
| 8       | not used |
| 9       | not used |

Service Port Connector - Serial RS 232 interface



Power terminals



| Pin no. | Signal   |
|---------|----------|
| 1       | TX+      |
| 2       | TX-      |
| 3       | RX+      |
| 6       | RX-      |
| other   | not used |

Ethernet connector for Modbus





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