For more than 30 years, the chemical industry in Germany has built analyser houses on the basis of recommendations that had been developed, and proven their value, under practical conditions. Initially, these recommendations were compiled in a NAMUR recommendation. The currently valid IEC 61285 (latest version 2015) which contains important parts of NAMUR recommendations was first published in 1994. Today, this standard is used as a basis for setting up analyser houses.

Basically, IEC 61285 is a construction standard laying down requirements for the safe construction and operation of analyser houses, for providing suitable ambient conditions and for the practicable maintenance of analyser systems. The operator is responsible for construction and operation. The actual installation depends on the intended use, particularly the substances to be analysed, and the location. As with all technical facilities, the operator has to evaluate the safety of analyser houses in a hazard assessment (as stipulated in Germany by the Ordinance on Industrial Safety and Health). IEC 61285 provides an important basis for this assessment.

Note: For analyser houses reference is made to the procedure described in IEC 60079-10-1 (Explosive atmospheres – Classification of areas) to determine the risk arising from potentially explosive atmospheres and adjust the ventilation system to the potential sources of release.

IEC 61285 comprehensively regulates the installation of analyser houses, also with regard to explosion protection (from the operator's perspective).
Then there is also IEC 60079-13 which covers explosion protection in pressurized rooms "p" and/or rooms with technical ventilation. This standard was written as a product standard for explosion-proof devices. Its aim is to describe normative requirements permitting such a room to be certified as a traded commodity within the meaning of the IEC standards or - if the harmonisation of the standard is to be defined according to the ATEX guidelines (which is not yet the case) - within the meaning of the ATEX guidelines, i.e. the entire room is categorised in terms of an Equipment Protection Level (EPL) or a device conformity category according to ATEX. The safe layout and design of the analyser house are the responsibility of the manufacturer. Consequently, the analyser house becomes a commodity.

For the reasons outlined below NAMUR does not consider such an approach expedient for analyser houses in many cases:

1. Analyser houses are designed for special measurement tasks based on special procedures and individual systems. An external manufacturer cannot be familiar with this individuality and make proper allowance for it. The operator of the process plant, however, knows of any potential risks at the site of operation, because he has to perform a hazard assessment of the plant, including the substances involved. For this reason it is the operator who, according to a construction standard, should be addressed with regard to the safe installation of an analyser house.

Note 1: It is pointed out in IEC 60079-13 that, if necessary, the manufacturer has to obtain information from the operator to ensure safe installation. The operator is held responsible for providing this information. As a result, part of the manufacturer's responsibility is indirectly shifted back to the operator. Given this situation, the operator could assume overall responsibility according to a construction standard right from the start. Quite apart from that, it appears very questionable as to whether such a shift of responsibility from the manufacturer to the operator is admissible under the ATEX guidelines. The minimum requirement for such a procedure would be that the manufacturer already knows the operator at the time of manufacture, which is contrary to the idea of freely tradeable commodities.

Note 2: For common identical plant types traded as a commodity it may make sense to standardise pressurisation and/or ventilation. However, this does not apply to chemical or pharmaceutical process plants whose individual design needs to be considered on a case-by-case basis.

Note 3: For rooms, in particular, building law provisions must be observed which may vary from region to region and cannot be covered by a type standard for explosion-proof devices.

2. Leaking combustible liquids are always a potential source of a large amount of released combustible vapours which cannot be controlled by pressurisation with only air as the protective gas. Since people regularly walk through, and occasionally work in, analyser houses, inert gas has to be ruled out as protective gas.

Consequently, apart from ventilation explosion safety in analyser houses may require additional measures tailored to the use case, which need to be defined in a hazard assessment. Such measures may be of a technical or organisational nature. As outlined above, a qualified assessment can only be performed by the operator.
3. Substances introduced into the analyser house for measurement purposes are often toxic. This is why it makes sense to develop a standard to address not only the explosion hazard, but other hazards as well which might arise in connection with an analyser house. This is exactly what IEC 61285 has done.

4. As a rule, it will only be possible to a very limited extent, or not at all, to change the interior equipment of an analyser house certified under IEC 60079-13 without invalidating the certification. However, providing an add-on to an on-line analysis, changing an analyser type, changing inlet and outlet lines are common requirements during the unit's service life. Process plants, too, are subject to changes during their service life resulting in changed measuring tasks. In the event of such changes, the user can no longer invoke the original certification according to EPL or ATEX device category (for the entire analyser house) and needs to perform a (new) hazard assessment anyway. This is in keeping with normal change management which is common for process plants.

5. As has already been pointed out, it does not make any sense from the operator's point of view to consider analyser houses for chemical or pharmaceutical plants as independent commodities, because without knowing the specific use case a manufacturer cannot a priori develop a safe design. The on-line analyser with the surrounding space should be regarded as a (small) system rather than a device. Just as a chemical or process plant in its entirety cannot be certified as a device, this is usually not possible for analyser houses, either.

Of course, the above statements do not preclude requirements laid down in IEC 60079-13 for explosion protection from being adopted as building requirements, as it were. This is in fact done by citing IEC 60079-13 in the appropriate passages of IEC 61285. (In IEC 61285 the maintenance team is responsible).

Any change to an analyser house installed under the responsibility of the operator requires an operator change management with a hazard assessment, including explosion hazards. It is also possible to install an analyser house by means of a container. The container construction then counts as an installation method, but the hazard assessment must always be performed with a view to final use. With regard to explosion protection, however, the container itself is not a commodity or device within the meaning of IEC or ATEX. The transport of a container (not designated as a commodity according to EPL or device category) from plant A to plant B is also a change that is subject to change management.

Of course, specialist companies may be commissioned to construct an analyser house according to IEC 61285. However, specifications must be defined by the operator. The operator is also responsible for selecting appropriate specialist companies (contracting authority). To evaluate the analyser house in terms of a hazard assessment, the operator may also resort to expert test results provided by a competent specialist company without having to repeat these tests. However, the operator has overall responsibility for the safety of the analyser house. The manufacturer cannot be held liable for explosion protection in terms of device conformity according to ATEX and/or EPL under IEC.
Conclusion:

Due to the individual characteristics of analyser houses in the chemical and pharmaceutical industry, it is recommended that they be set up under the operator's responsibility in accordance with IEC 61285 as a preferred choice. The safe operation of such an analyser house regarding its specific use must be defined in a hazard assessment. (Note: In addition to technical measures, organisational measures are also considered in this assessment. Initial and in-service tests are part of organisational measures.). Changes should meet the requirements of a change management system. This procedure has been established over many years and found international recognition in IEC 61285.

The operator is fully responsible for safe operation, including explosion protection. In this case, the manufacturer cannot be held liable for explosion protection.