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1. Generalities

The following operation instructions are valid for F & M - Y-Type strainer of figure no.

**305,316,350,351,352,354,380,385,390,
391,393,394,396,397**

are used to hold back solids in pipelines. The medium (liquid or gaseous) flows through the strainer.

F & M Valves are subjected to the rules according to DIN EN standards as well as the technical regulations AD2000 A4 and PED 2014/68/EU in their development and construction.

By a correct assembling, maintenance or repair we guarantee an activity free of troubles.

The manufacturer carries no responsibility for efficiency and safety of the valves, whenever these operating instructions are not observed and followed accurately.

The valves are marked, according to DIN / EN 19 (ISO 5209) as follows: nominal diameter (DN), nominal pressure (PN), body material, heat-no or specimen-no, manufacturer brand and factory number, and if necessary, flow direction arrow, admissible operating temperature and admissible operating pressure (bar). By affixing the CE mark to the valve, we also declare conformity according to DRGL 2014/68 / EU

ATTENTION! The valves must not be activated beyond the limits and rules indicated in the different documents (such as operation rules, purchase documents, type sheets). Operations beyond the indicated limits lead to overstrain which cannot be sustained by the valves.



A non-observance of this warning can cause injuries to persons and defects of the machines, such as:

- Injuries caused by escaped medium (cold/hot, toxic, under pressure),
- Affect in activity or damage of the valve.

The descriptions and rules included in this operation instruction refer to standard types but are also valid for alternatives.

These operation instructions do not take into consideration:

- Any accident and incident which can arise by assembling, operation or commissioning of the valves.
- Any safety rule in relation with the place where the valve is installed. The operator is responsible for the observation of the safety rules, - also by the assembling staff.

The connected loads prescribed for driven valves, as well as the instructions for assembling, commissioning and operation have absolutely to be observed.

It is essential that the valves are handled by skilled staff that must be aware of the interactions between the valves and the system in which they are installed. An incorrect use of a valve may cause strong consequences to the complete system, such as

- Escape of medium
- Stop of the unit
- Affects, decreases, or increases of operation or work of a system or unit.

For any further inquiries or in case of damage, please contact F & M Armaturen.

In case of local inquiries or orders, especially for spare parts, please indicate the production or factory serial number, the type, the model version and possibly also the year of construction.

The technical data referring to the valves can be found in their technical documentations (paragraph 4).

In case of a return transport it must be proceeded as explained in paragraph 3 <Transport>.

2. Safety

These operation instructions contain essential information that has to be observed by assembling, operation and commissioning of the valves.

For this reason, they have to be read by the assembling staff, by the skilled staff and by the operator before the valve is assembled and put into operation and they should always be kept in the proximity of the valve.

Not only the general safety rules indicated in this main paragraph have to be observed, but also the other ones indicated in other paragraphs.

2.1 Indication of notes in the operation instructions

The safety warnings contained in this operation instruction, which have to be observed in order to avoid injuries to persons, are indicated by the following general and particular pictographs:

Warning!



Security signal acc. to DIN 4844 - W 8

In order to avoid defects of valve efficiency and of its accessories the following warning mark has to be observed:

ATTENTION!

The signs marked directly on the valve (such as DN) have absolutely to be considered and kept in a readable condition.

2.2 Dangers that can result if safety instructions are not observed.

If the safety instructions are not observed injuries to persons, environment and valve, or system can arise, and the indemnity rights get lost.

In particular the non-observance of the safety notes can cause dangers such as:

- Break down of important functions of the valve or unit
- Failure of prescribed methods of commissioning and handling
- Danger to persons caused by electrical, mechanical and chemical impacts.
- Environmental injuries caused by a leakage of dangerous materials.

2.3 Working with safety consciousness

The safety instructions included in this paper, the national regulations for prevention of accidents, as well as the internal regulations referring to work, operation and safety have to be observed by the operator.

2.4 Safety instructions for the operator / user

- Whenever some hot or cold valve parts (f. ex. Casing parts or handwheel) may cause any danger, these parts have to be constructed in a way that they are protected from contacts.
- The contact protection for moving parts (such as coupling) must not be taken away while the machine is working.
- Leakages (f. ex. in spindle gaskets) of dangerous conveyed materials (explosive, toxic, hot) have to be removed in a way that no danger to persons or environment can arise. Legal de- terminations must be respected.
- Injuries by electrical energy have to be excluded (please find details to this point in the VDE and local power supply enterprise regulations).

2.5 Safety instructions for commissioning, inspection and assembly works.

It must be provided that all commissioning, inspection and assembly works are executed by skilled staff, who must have previously studied these operation instructions.

Basically, when any kind of work on a valve is executed, the valve has to be cooled down and free of pressure and the evaporation temperature of the medium must be lower than the temperature of all parts it gets in contact with.

Also, basically, works on a valve have to be executed when it is stopped. The procedure to stop a valve operation is described in this paper and has absolutely to be observed.

Valves which get in touch with health injuring media have to be decontaminated.

Immediately after the work is done, all safety and protection devices have to be put into position or operation again. Before putting the valve into operation again, the points referring to paragraph 6 <putting into operation> have to be observed.

2.6 Arbitrary reconstruction and manufacture of spare parts

Reconstructions or modifications of the valve are only acceptable under agreement with the manufacturer. The use of original spare parts and by the manufacturer authorized accessories promotes safety. If any damage is caused by using other parts the liability for the consequences can be cancelled.

2.7 Inadmissible operation modes

A safe operation is only guaranteed if the valve is used according to the determinations included in the „generalities“ of this operation instruction. The limits included in the technical documentation must not be exceeded.

3. Protection, Transport and storage

3.1 Corrosion protection

3.1.1 Carbon steel valves

Valves made out of unalloyed or low alloyed cast steel are painted with a hard-sticking primer made of a 2-components color based on epoxy resin paint. The minimum film thickness is 70 µm. The inner surfaces are free of paint and only coated with a temporary corrosion protection (e.g. oil). Machined flange facings are protected against outside influences with a strippable varnish.

3.1.2 Stainless steel valves


Valves made out of stainless steel will be delivered without coating.

3.2 Transport

The valves are delivered in a closed condition and its connecting holes are shut up by cover caps.

Valves will be supplied as ready for operation.

ATTENTION! During transportation and storage valve have to be closed. Connecting holes have to be shut up by suitable means (cover caps, foils) in order to avoid any damage to the valve seats.

Valve weights are indicated in the corresponding manufacturer documents (type sheets  paragraph 4.1 <corresponding documents> acknowledgement)

After delivery, respectively before assembly the valves have to be inspected in order to exclude any transportation damage.

3.3 Storage

The storage has to be effected in a way that it can work perfectly even after a longer storage period.

For this purpose, it is necessary

- To keep the valve closed (in order to protect the seat facings)
- To take measures against soiling (dust, sand, mortar, respectively building materials), frost and corrosion using plastic foils.

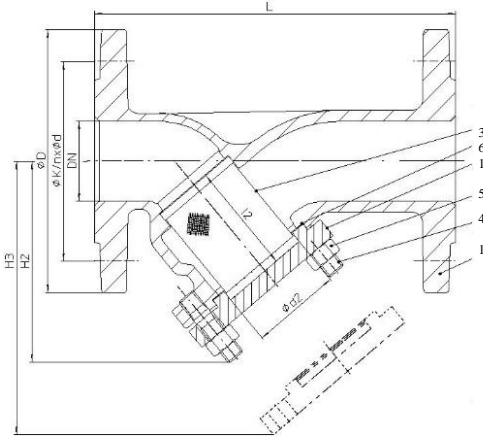
4. Description / documents

The following pictures represent some examples for the principle valve construction. Pictures and information referring to particular construction series can be found in the corresponding type sheets.

4.1 General view: documents

4.1.1 Y-Type Strainer

flanges acc. to EN 1092-1,
facing acc. to EN 1092-1
length acc. to EN 558, R14



4.2 Teileverzeichnis

| Pos. | Benennung | Designation | Material | WNr./DIN |
|------|------------------------|---------------|---------------|----------|
| 1 | Gehäuse | Body | GP240GH+N | 1.0619+N |
| 2 | Deckel | Cover | GP240GH+N | 1.0619+N |
| 3 | Sieb | Screen | X5CrNiMo18-10 | 1.4301 |
| 3.1 | Stützkorb | Basket | X5CrNiMo18-10 | 1.4301 |
| 4 | Schraube/Stiftschraube | Screw / Bolts | 25CrMo4 | 1.7218 |
| 5 | Mutter | Nuts | 25CrMo4 | 1.7218 |
| 6 | Dichtung | Gasket | SS304/grafit | - |

| Pos. | Benennung | Designation | Material | WNr./DIN |
|------|------------------------|---------------|------------------|----------|
| 1 | Gehäuse | Body | GX5CrNiMo191102 | 1.4408 |
| 2 | Deckel | Cover | GX5CrNiMo191102 | 1.4408 |
| 3 | Sieb | Screen | X6CrNiMoTi17-2-2 | 1.4571 |
| 3.1 | Stützkorb | Basket | X6CrNiMoTi17-2-2 | 1.4571 |
| 4 | Schraube/Stiftschraube | Screw / Bolts | A4-70 | - |
| 5 | Mutter | Nuts | A4 | - |
| 6 | Dichtung | Gasket | SS316/grafit | - |

4.3 Functionality

The flow medium flows through the dirt trap according to the specified flow direction and is cleaned accordingly by the Y-strainer sieve.

Y-strainer consist of the pressure-bearing parts: Body (1) and cover (2) .

Body (1) and cover (2) are secured with screws / Studs (4) and nuts (5) connected and through the flat gasket (6) sealed to the outside.

The sieve insert (3) is made of stainless-steel material

4.4 Applications limits

ATTENTION! Depending on the materials the pressure temperature graduations (rating tables) of the respective materials are to be taken in consideration. Moreover, application is limited depending on the choice of the seal material and it is influenced by the material combination of the connecting elements (bolts and nuts).

4.5 Variants / accessories

- a) Fine sieves
- b) Magnet unit for separating ferritic particles
- c) Bores for connecting a pressure differential measurement

5. Installation

5.1 Generalities

ATTENTION! The pipeline has to be installed in a way that injurious shearing and bending forces during installation and activity are kept away from the valve bodies (1). This is to avoid leakiness and destruction of the body.

ATTENTION! Before installation, the cover caps have to be re- moved from the connecting holes. The flange facings must be clean and undamaged.



The flange gaskets must be well centralized.

Only bolts and gaskets of admissible materials may be used. For the flange connection all flange drill holes have to be used.



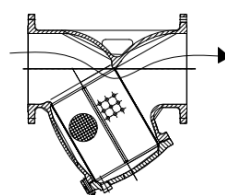
When varnishing the pipelines, no bolts and nuts and accessories must be painted (function affects).

During any construction work the valves have to be protected from dust, sand and any other construction material. (Please cover with suitable means).

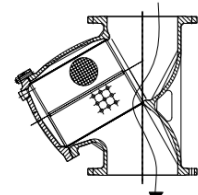
Valves and pipelines working in high temperatures (>50°C) or low (<0°C) must be protect from touch by insulating. Alternatively, the danger must be indicated by warning boards on the valve side.

5.2 Installation position

The Y-strainers should preferably be installed with the housing cover pointing downwards. Deviating installation positions must be agreed with F & M Armaturen. The direction of flow must be observed.



Horizontal Installation



Vertical Installation

5.3 Avoiding excessive pressures

F & M Armaturen are generally only suitable for operating conditions that are shown in the associated pressure / temperature tables. Appropriate measures must be taken to ensure that there are no impermissible loads on the valves, the arrangement in the pipelines or unfavorable operating conditions.

5.4 Welding instructions / pipeline assembly

For welding works on the valves, the pipeline manufacturer is responsible.

ATTENTION! Whenever the valves are welded with butt welding ends or socket weld ends and the pipeline is welded with valves that are already installed (pipeline assembly), it has to be taken care that no impurity get inside of the body or even stay there.

ATTENTION! The welding cable (opposite pole) must be attached by no means to any functioning parts of the valve, otherwise scorching can be caused.

The insert depth of valves with socket weld ends has to be observed accordingly to the referring standard. A gap between pipe end and sleeve ground serve as prevention from inadmissible welding seam strain.

5.5 Assembly work

Suitable transport and lifting equipment must be used for the assembly work.

Ensure that there is enough space to dismantle / assemble the sieve insert.

6. Operation/commissioning/ Decommissioning

(see also notes under section 5 <Installation>)

6.1 Operation / commissioning

6.1.1 General

Before commissioning, the material, pressure and temperature specifications of the valve must be compared with the operating conditions of the pipeline system.



Any pressure surges (water hammer) that may occur must not exceed the maximum permissible pressure. Protective measures are to be provided.

The sieve inserts must be cleaned regularly. The maintenance intervals are to be determined by the operator depending on the contamination.

6.2 Functional check

The following functions must be checked:

The screw connection of the cover with the flat gasket must be checked for leaks after the first commissioning / heating of the valves (even with maintenance-free valves!). If necessary, the screw connection on the cover should be tightened gradually, crosswise and evenly turning clockwise.

6.3 Decommissioning

During periods of standstill, liquids which change their state due to a change in concentration, due to polymerization, crystallization, solidification, or the like, must be drained from the line system. The pipe system must be flushed if necessary.

6.3 Monitoring / pressure difference of sieve insert

The sieve insert is for a maximum pressure difference of 2bar designed. The operator is responsible for regularly checking the sieve insert for contamination. The maximum pressure difference during operation should not exceed 1 bar. Monitoring can be carried out by measuring the pressure difference. 7. Service & Maintenance

7.0 Service & Maintenance

7.1 Safety instructions

For all maintenance and repair work on the valve, the safety instructions listed below and the general instructions in Section 2 <Safety> must be observed.

ATTENTION! In any case, suitable spare parts and tools must be used, even in the event of emergencies, as otherwise the proper functioning of the valves cannot be guaranteed.

7.1.1 Dismantling of valves

Before removing complete valves from the pipelines, the valves themselves or the strainer insert, that is

- before loosening the cover screw connection
- opening and venting plugs before closure

all valves must be depressurized and cooled down to such an extent that the evaporation temperature of the medium is not reached in all rooms that come into contact with the medium and scalding is excluded.

Opening valves under pressure can be fatal!



If poisonous or easily flammable media, the residues of which lead to corrosion damage with the humidity in the air, have to be emptied and flushed or ventilated.

If necessary, wear protective clothing and a protective mask!

Due to the installation position, any remaining liquid in the valves must be collected and disposed of properly.

The valves must be carefully flushed and emptied prior to any transport.

If you have any questions, please contact F & M-ARMATUREN GmbH & Co. KG.

7.2 Maintenance

All parts of the valves are largely maintenance-free. The materials are chosen so that wear remains minimal. However, for operational safety reasons and to reduce repair costs, all valves should be checked regularly, i.e. at least once or twice a year.

The operator is responsible for setting appropriate test and maintenance intervals depending on the use of the valves.

7.3 Assembly of Valve

Before assembling the Y-Strainer, the contact surface of the seal must always be cleaned, and a new seal (item 6) inserted.

The cover screws (pos. 4 + 5) must be tightened evenly and crosswise.

Tightening torques of the screw connection

| DN | Bolts / Nuts | Torque Nm |
|---------|-----------------|--------------|
| 16-32 | M10 | 20-35 |
| 40 | M12 | 25-40 |
| 50-65 | M12 | 60-80 |
| 80-150 | M16 | 100-125 |
| 200-250 | M20 | 150-200 |
| 300-400 | M24 | 340-410 |

After reassembly and before commissioning, the valves must be subjected to a tightness and strength test in accordance with EN 12266.

All repair and maintenance work must be carried out using suitable tools and original spare parts.

The safety instructions in sections 2 and 7 must be observed.

8.2 Malfunctions / elimination

Leak by the cover seal

- Retighten the screw connection of the cover.
- Renewal of the cover seal.

Before inserting a new sealing ring or a new flat gasket, the sealing surfaces must be carefully cleaned.

ATTENTION! No additional sealing aids may be used with asbestos-free sealing rings. When using non-stick coatings, seal manufacturers must use agents that are expressly recommended.

“Pressure loss (differential pressure)> 1bar”

Sieves insert dirty

- Disassembly of the cover screen
- Pull out the sieve insert and clean it
- Installation see point 7

If you have any questions, please contact F & M ARMATUREN.