Special assembly
“Fail-Safe”

1. Meaning „Fail Safe“

Safety in case of failure
A Fail-Safe drive has to close and open an armature safe and self-dependent in case of damage or breakdown. This has to also be ensured in case of a breakdown of the control unit and when the Fail Safe drive isn’t accessible because of danger. The Fail-Safe function is supposed to prevent possible damage, caused by not open or not closed armature.

2. Application possibility

- Guaranteed fire water supply in case of fire
- Maintaining the cooling circuit in the power station
- Preventing unwanted gas leakage in supply systems
- Opening of flue gas- and fresh air ducts for personal protection in buildings or tunnels
- Retention of contaminated water in chemical facilites

3. Function

Fail-Safe drives in a final control element, which will electrically open and close with a motor and a power transmission The motor is reversible and can be operated by a clockwise- or counterclockwise rotation. The power transmission is made out of a self-locking worm drive and a single-or multi level downstream planetary drive. A spring is located behind the power transmission. While electric operated, this spring is always stretched in one direction of rotation. At the same time the circular motion and the turning moment of the drive will be carried on to the armature. In the undisturbed operation case, the self-locking worm drive prevents a spring return. Therefore the drive stays in position after shutting down the motor. The Fail-Safe drive is equipped with an electromechanic coupler for the self-dependent opening and closing process. The coupler is located behind the self-locking worm drive and offsets the self-locking. The spring is able to open or close the armature with a required turning moment. The activity of the spring is controlled by a automatic advance mechanism. The automatic advance mechanism stops a releasing process of the high stored energy in the spring and makes a gentle opening and closing of the armature possible, without any beat or vibration. The Fail-Safe drives are constructed for a 90°- movement. They have an electrical and a mechanical movement limit. The devices have two isolated final position switches for the electrical limit. The switches signal the supplied by customer control the moment to shut down the motor. The limit switch will be carried to the Fail-Safe position during a Fail-Safe movement through the spring. Through that, the Fail-Safe drive is immediately ready for operation after restoration of the normal state. The mechanical movement limit limits the spring deflexion or a emergency manual override by 90°.

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