Hydraulic Actuator Weight Loaded

**Type HAWL™**

The actuators with most reliable Emergency Shut Down function - ESD quick and easy installation on the valve - HYDROMAT® System “plug and play”

Modular concept for use on different valves:
- **Butterfly**
  - DN 150 ... 2000 – PN 6/10/16/25/40
- **Ball**
  - DN 150 ... 1200 – PN 6/10/16/25/40/63/100
- **Control (needle, plunger, piston)**
  - DN 150 ... DN1600 – PN 6/10/16/25/40/63/100

**HYDROMAT® concept for most reliable detection of rupture the pipeline:**
Butterfly valve with actuator HAWL™ and speed-overflow device (Paddle Trip Mechanism)
Hydraulic actuators weight loaded HAWL™ type are used at all critical areas where the pipelines must be reliable, immediate and controlled quickly for valve closing, e.g. in case of external power losing, cutting off electricity cables during the earthquake, disasters in a system, ruptured pipelines, etc.) while for the valve closing is used a potential energy of lifted weight. The counterweight and lift cylinder shut-off valve is used to stop the water on the pipelines automatically. The pipeline shut-off function must be guarantee under hardest condition of maximum flow rate or pressure and in case of electric power failure. The movement of the shut-off device (butterfly, ball valve, needle valve) is guarantee by means an hydraulic actuator composed by: hydraulic cylinder to maintain the valve open and a counterweight to close the valve.

Standard version to vertical and horizontal application the hydraulic actuators type HAWL™ of HYDROMAT® production are divided into 8 groups due to total torque transmission in the beginning of valve opening (BTO—Beginning To Opening). Standard design for torque transmission from 500 up to 250.000 Nm, taking into consideration international standard ISO 5211 which regulate the field to attachment of industrial valves and actuators.

**IMPORTANT:** HYDROMAT® principle to classification and selection for application the actuators type HAWL™

The system is based on the min. safety factor (ability to mechanically and hydraulically torque transmission from the actuator to valve flange). Safety factor in principle requires or selects the project or user of actuator. In addition the required torque transmission (depend of valve DN and PN) must be taken into account concrete field of application, valve design and function, flange type and size, etc...

Safety factors of actuator type HAWL™ to:

- mechanic system (Sfo and Sfc shows the ability to mechanically torque transmission) – to all sizes Sfo and Sfc >1,2
- hydraulic pressure system (Sfh shows the ability to hydraulically total torque transmission) – to all sizes Sfh > 1,6

Range of application actuators type HAWL™ to SINGLE and TANDEM design and specific types of valves:

- Butterfly valves DN 150 ... 2000 - PN 6/10/16/25/40 — see table below
- Ball valves DN 150 ... 1200 – PN 6/10/16/25/40/63/100
- Control (needle, plunger, piston) valves DN 150 ... DN1600 – PN 6/10/16/25/40/63/100

Arrangement of equipment and accommodation of weights are choose as needed. Standard variants are accord to the description, and the other sizes are upon request.

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**Arrangements**

- **Hydraulic actuator with weight, quickly and reliably close the valve, butterfly, ball and control valve**
- **A modular concept, compact design and standard attachment by ISO 5211 allows assembly quick and easy on valve, HYDROMAT® system “plug and play”**
- **Specially bearing of lever with the weight is performed so inside the actuator housing that on two bearing seats only transmit torque and no additional burdens to valve shaft, provide a simple and easy assembly**
- **Actuator is standard equipped with its own hydro power unit for autonomous operations, or can be used as an external source of hydraulic fluid pressure from 70-250 bar**
- **Actuator with its own hydro-aggregate is used for opening and automatic keeping open the valve position**
- **Standardly is used very reliable compact electro–hydraulic power units type CEHPU design enables seamless functionality in a working environment temperature −40/+80 °C. Special request and design of hydro power pack (carbon steel, stainless steel…) or different pneumo–hydraulic combinations**
- **On request offered is an also special version of power units: pneumatic, pneumo–hydraulic, etc… (see a separate catalogue for the hydraulic power units)**
- **All versions of actuators are equipped with a hand pump in a case of emergency forcible valve opening**
- **Structure was constructed with a lot of attention to respecting the regulations on environmental protection and the prevention of contamination with mineral oil**
- **Weight and lever are made separately (modular concept), simple installation can be easily incorporated into individual**
approach to solving the specific operating conditions and it is "user friendly"

− Standard version is performed with 2 adjustable end position micro-switch (protection IP65) for detection of valve openness and closing
− On special request actuator can be equipped with a rotary encoder (4–20 mA) position or additional micro switches
− Intelligent design the valves with suitable sensors for closing or opening controlling of flow and pressure
− Standard version has adjustable of 2 damping stages for closing process. On request is performed in 3 stages damping with activation in any position closing process
− Automatic safety shut off, as a standard, offers the possibility to connect a reliable device (paddle trip mechanism) for detecting and triggering the flow over speed, eg, ruptured pipeline, etc ...
− The concept of electro–hydraulic control system NO (normally open) or NC (normally closed)
− With fixed mechanical limiters can be adjusted closed position ± 3%
− With self–aligning clevis with its (un) tightening can be adjusted open position ± 3%
− Adjustable the valve opening and closing time with flow control valve–pressure compensated with security function
− Using a "service pin" is possible to "locking" the valve at the open and close position in a case of service works as a safety
− Actuators type HAWL™ designed: max operation pressure 160 bar, test pressure 250 bar

Electric control

− Complete electrical control is placed on a separate electrical cabinet on the actuator with the possibility for the local / remote switching on basis SIEMENS plc
− Only the electrical junction box located on the actuator to connect to a remote control – individually solve control

Accessories and auxiliary equipment

− Hydro–mechanical over speed the tripping paddle detector
− Magnetic inductive or ultrasonic the velocity detector
− Air admission automatic valve to be installed downstream to avoid depression on the line
− Electrically operated system for simulation of intervention of over velocity detector

Materials

− Housing and the actuator lever weights: carbon and structural steel
− Weight: cast iron EN–JL 1040 (GG–25), steel
− Bearings: bronze, PTFE
− Piston rod: stainless steel and hard–chromium plated
− Hydraulic control block: carbon steel zincked or request of stainless steel
− Seals: low friction combinations NBR, PTFE
− Tubes and couplings: zinc and nickel galvaniz ed, on request of stainless steel

Corrosion protection

− Epoxy powder coating RAL 5005 – thickness >200 microns

Area of application

− Anywhere to quickly and reliably shut down the flow
− Reinforcement of protection the turbines and pumps
− Ensuring a ruptured pipeline through additional electro–hydraulic device connected to actuator HAWL™

Testing and permissions

− takeover test according to EN 12266 (DIN 3230, Chapter 4)

The data for the selection of actuators

− Scope, fluid, operating conditions and environment temperature
− Maximum flow through the valve
− Maximum pressure difference
− Available pressure and capacity in the case of an external source of the drive the hydraulic oil
− Valve opening and closing time
Hydraulic Actuators Weight Loaded — type HAWL™

The actuators with most reliable Emergency Shut Down function - ESD

The standard design divided into 8 Groups to total transmission torque 500 to 250,000 Nm

Flow control with sensors for:

- pressure
- differential pressure
- flow rate
- flow velocity
- over speed device (paddle trip mechanism for triggering in case of exceeding the flow velocity of a ruptured pipeline)
- level

Compact electro - hydraulic power unit type CEHPU with hand pump

HAWL™ actuator base module

Butterfly valve

Ball valve

Standard electro box with local control panel
LOCAL / OFF / REMOTE Command

Electro connection box

Needle (piston) valve - Flow control valve

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More than thirty years experience in designing and manufacturing of actuators and valve automation

The numerous references worldwide

HYDROMAT® actuators and control systems offer complete solution of fluid flow control

- Butterfly valve 1400/PN10 – Hydropower plants, Austria
- TANDEM design — Butterfly valve 1400/PN25 with HYDROMAT® speed overflow device — hydropower plants, Norway
- SIEMENS Project gas power plants 450 MW, Belgium
  Butterfly valve 1400/PN16 — cooling system
- Flow control with Needle valve DN400/PN40 – different applications in water distribution systems
- Butterfly valve 1400/PN10 with HYDROMAT® speed overflow device — Hydropower plants, Germany
- Butterfly valve 400/PN25 with HYDROMAT® speed overflow device — Hydropower plants, Germany

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