CHECK VALVES AND AUTOMATIZED DAMPING UNIT TYPE AHSAU

PROVIDING COMBINED FUNCTIONS OF CHECK VALVES WITH FLAPS OR DISCS

PROVIDES GREAT FUNCTIONING AND CONTRIBUTIONS OF ENORMOUS SAVING OF ENERGY AND MONEY

HYDROMAT Flow Control

Butterfly tilting check valve

Swing check valve

Shortly, what we obtain and why is Automatized Hydraulic Shock Absorber Unit type AHSAU the best solution:

- Hydraulic opening and hold each position of openness, that result with:
  - Without energy losses which means without financial losses
  - Excellent functions in engaging in drive of the pumps
  - Providing flow control and on/off functions
- Hydraulic holding of close position, that result with excellent sealing and tightness of close position
- Hydraulic controlled closing with excellent damping characteristic for any water hammer or back flow intensity
- Standard design without lever and weight provides simple installations in any position at any angle of pipeline
- In case of power failure or device malfunction automatized damping unit work as a classical damping system
- Option, hydraulic hand pump to check valve opening or closing
- Simple and easy mounting on any type of check valve with flap design
- Simple operation mode results with easy connecting to electric control system by customer

Hydraulic or pneumatic operating in OPENING DIRECTION in addition to effects of pump flow rate:

- Hydraulic by Electro-Hydraulic Power Unit
- Hydraulic by Air-Hydraulic Power Unit powered by compressed air
- Pneumatic cylinder powered by compressed air

Operating in CLOSING DIRECTION in addition to effects of backflow:

- Hydraulically, standard design by hydraulic and accumulator – preferable solution is without lever and weight
- Possible design by different combinations with pneumatic cylinder, spring, lever with weight

EXAMPLE OF OPERATING CYCLE

OPENING direction:

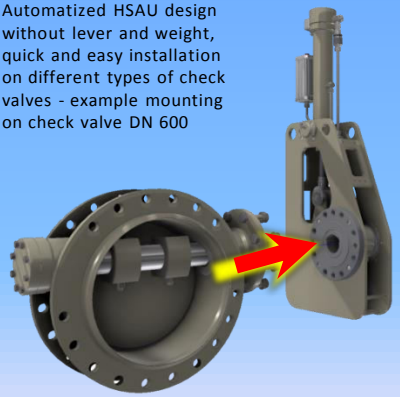
1. Pump start
2. The disc of the check valve automatically takes up a position depending of the flow rate.
3. In any position of openness is possible to start of hydraulic power unit which hydraulically achieved and hold full open position.

CLOSING direction:

1. Pump stop and flow slows
2. Damping unit automatically quickly pushes the flap of the check valve in close direction. Through the whole time acting of hydraulic damping, adjustable in two or three stage. In any position of openness on the flap we have a full hydraulic control.
4. If it's necessary can be achieved hydraulic holding of close position and thus provides full sealing and tightness.

On request, the operating system can be easily adapted to specific project requirements

Automatized HSAU design without lever and weight, quick and easy installation on different types of check valves - example mounting on check valve DN 600



Example of application at serious industrial check valves – Excellent high speed closing by operating with high torques

Intensity of absolute pressure on flap or disc at different check valve openness

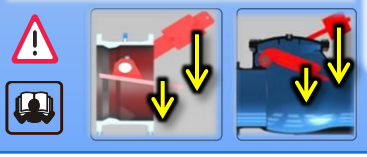
Hydromat® SOLUTIONS FOR WATER HAMMER PROTECTION

More than thirty years of experience in designing and manufacturing of hydraulic damping systems have resulted with

THE WORLD INOVATION TO OPERATING OF CHECK VALVES WITH FLAPS

DAMPING SYSTEM THAT ADDITION ITS PRIMARY PURPOSES PRIVIDES VERY LARGE SAVINGS OF ENERGY AND MONEY

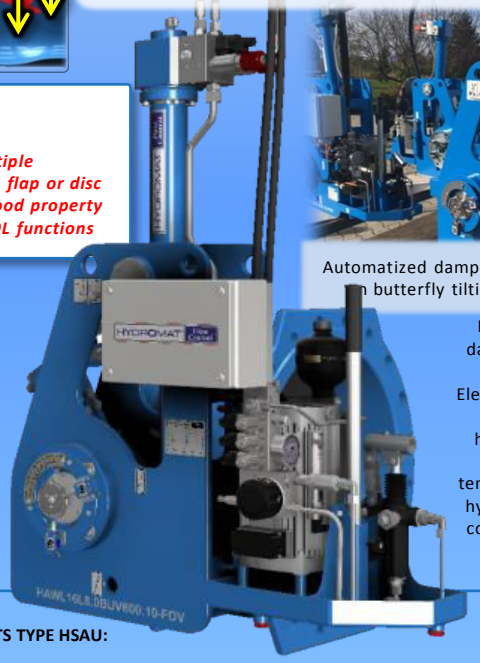
Classical solution are a source of enormous energy losses



What it signifies the concept of „COMBINED CHECK VALVES" ? This means providing of reliable multiple functions in a single check valve with flap or disc design primarily as the CHECK and good property to ON/OFF and simple FLOW CONTROL functions

WITH THIS DEVICE YOUR CHECK VALVES GET A NEW DIMENSION

Automatized damping unit HSAU16 mounted on butterfly tilting check valves DN700



Example of automatized damping unit type HSAU16 powered by Compact Electro-Hydraulic Power Unit type CEHPU enclosures heavy duty as a standard design for low ambient temperature -40°C to +80°C, hydraulic blocks, pipes and connections from stainless steel, equipped with hydraulic hand pump

OTHER ADVANTAGES OF AUTOMATIZED DAMPING UNITS TYPE HSAU:

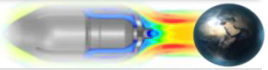
- Innovative and most reliable heavy duty concept
- Damping torque transfer without additional bending of valve shafts or additional loading of check valves, such as bearings and the like
- Universality of application, quick and easy installation" plug and play application" different types of check valves directly or by using an intermediate flange – mounting system based on ISO 5211 flange
- Very low power consumption for drive of damping unit
- Two or three hydraulic damping stages, simple adjustment
- Safety system to torque control protect of damping units and check valves
- Wide range of damping torques, 8 standard sizes, applicable to damping torques from 500 to 275.000 Nm/damping unit
- Selection of HSAU damping units according to the conditions of water hammer and back pressure, not according to the size of check valves – optimised cost of equipment
- Simple harmonization with specific customer requirements
- Simple interchangeability of all parts means simple maintenance and long service life even in harshest conditions
- Considering all of the specified factors, the HYDROMAT damping units are the most competitive ones in terms of price
- Depending on design, they can be mounted on a pipeline in any position or angle

CHECK VALVES AND AUTOMATIZED DAMPING UNIT TYPE AHSAU

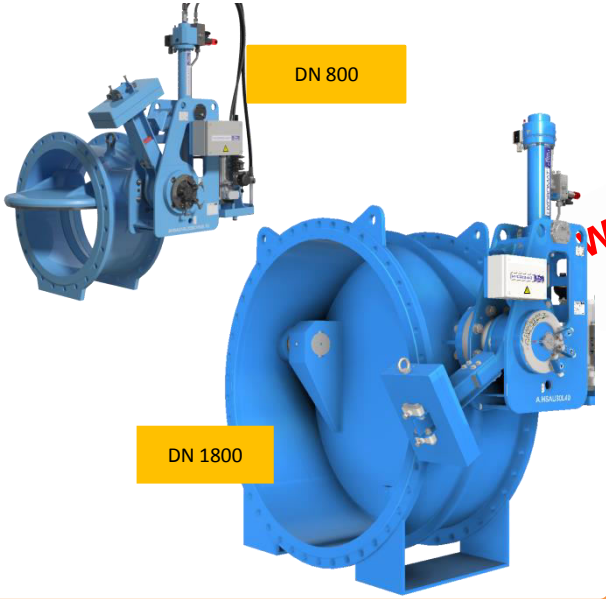
PROVIDES GREAT FUNCTIONING AND CONTRIBUTIONS OF ENORMOUS SAVING OF ENERGY AND MONEY

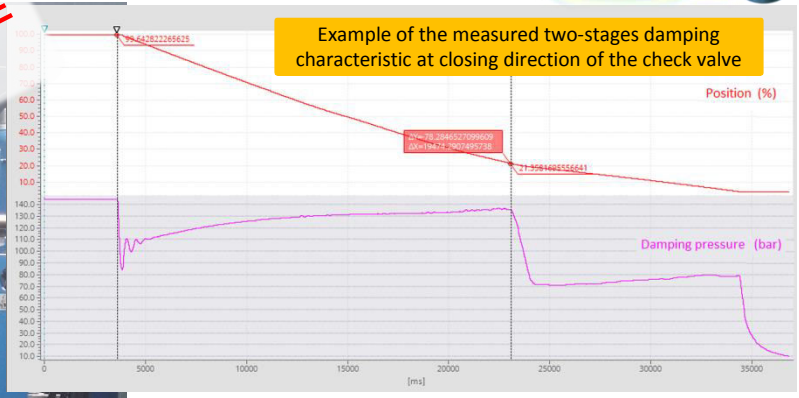
HYDROMAT® Flow Control

SOLUTIONS FOR SYSTEM PROTECTION



Standard design of butterfly tilting check valve equipped with automatized damping unit type AHSAU

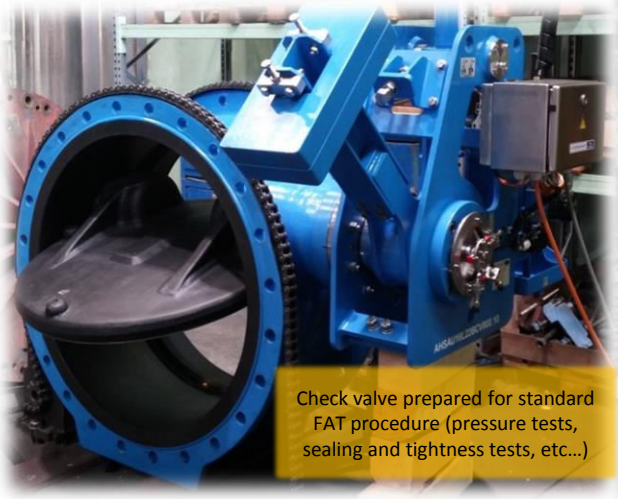




Example of the measured two-stages damping characteristic at closing direction of the check valve

Before delivery each damping unit type AHSAU is tested on HYDROMAT® Torque Test Station at *real operating torques and times*:

- TEST OF NORMAL OPERATION
- TEST OF EMERGENCY OPERATION
- ALL FUNCTIONAL TESTS



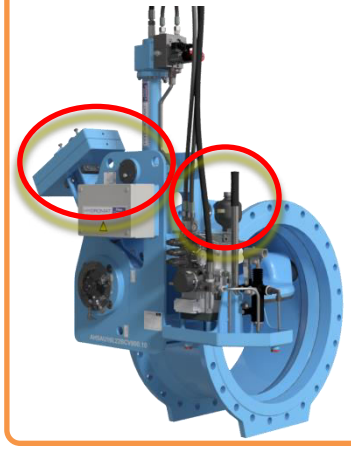
Check valve prepared for standard FAT procedure (pressure tests, sealing and tightness tests, etc…)

Example of HYDROMAT equipment for function testing and complete FAT – Factory Acceptance Tests

Automatized damping unit type AHSAU
Different possibilities to closing direction

On request, the operating system can be easily adapted to specific project requirements

Different combination weight & accumulator



Design only with accumulator