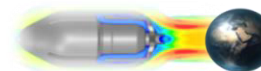


HYDRAULIC SHOCK ABSORBERS. type HSA.DPA & EPA

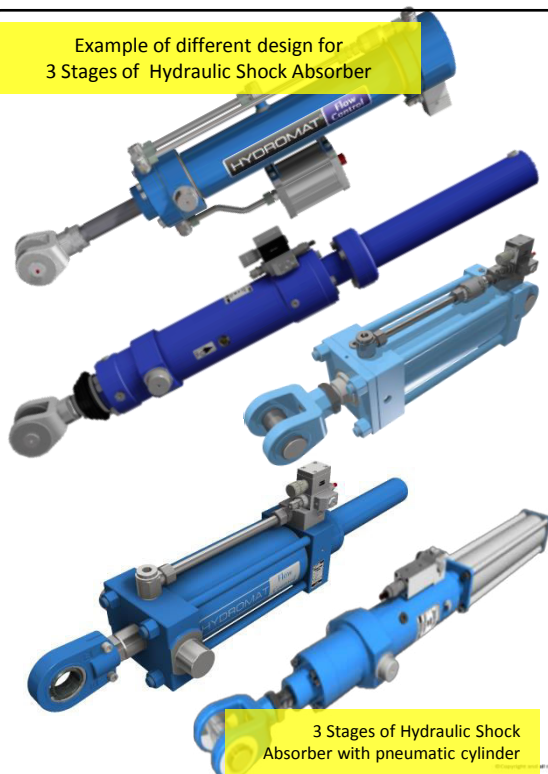
Design on the base of Differential Piston Area type DPA and Equal Piston Area type EPA



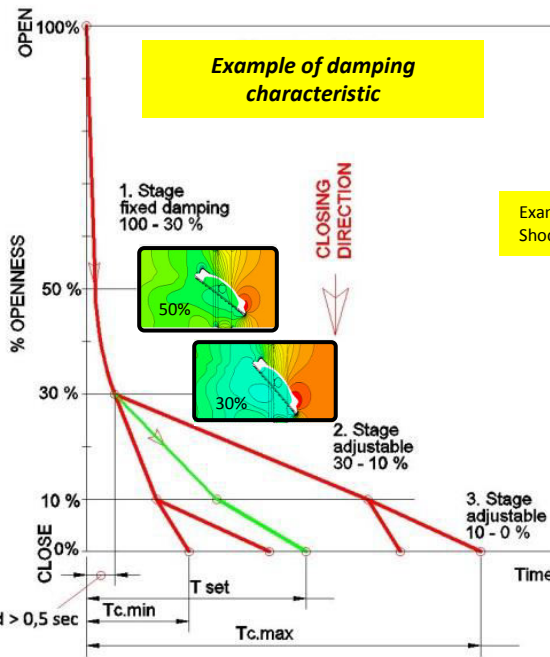
HYDROMAT Flow Control

SOLUTIONS FOR SYSTEM PROTECTION

Example of different design for 3 Stages of Hydraulic Shock Absorber



3 Stages of Hydraulic Shock Absorber with pneumatic cylinder



8 standard sizes, Damping energy 5 to 150 kJ

HYDROMAT standard design of shock absorbers type DPA & EPA based on two or three damping stages. Other on request.

Example of percentage of damping stage

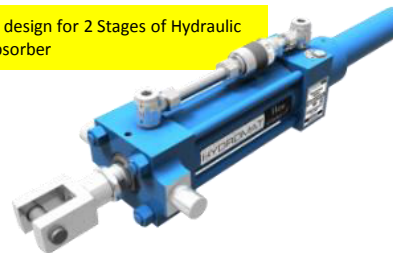
Two stage damping:
1. Stage 100 - 30 %
2. Stage 30 - 0 %

Three stage damping:
1. Stage 100 - 50 %
2. Stage 50 - 20 %
3. Stage 20 - 0 %

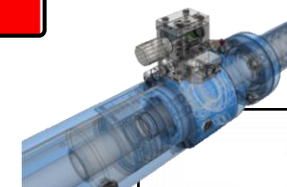
Range of ambient temperature, valid to all types and sizes:

- Standard: - 30 °C to 100 °C
- High: - 20 °C to 160 °C
- Low: - 40 °C to 100 °C

Example design for 2 Stages of Hydraulic Shock absorber



For all types. The piston rod made in stainless steel and additional rubber bellow protection for the hardest working environments



Hydraulic control block

3 Stages type HSA.EPA.3S

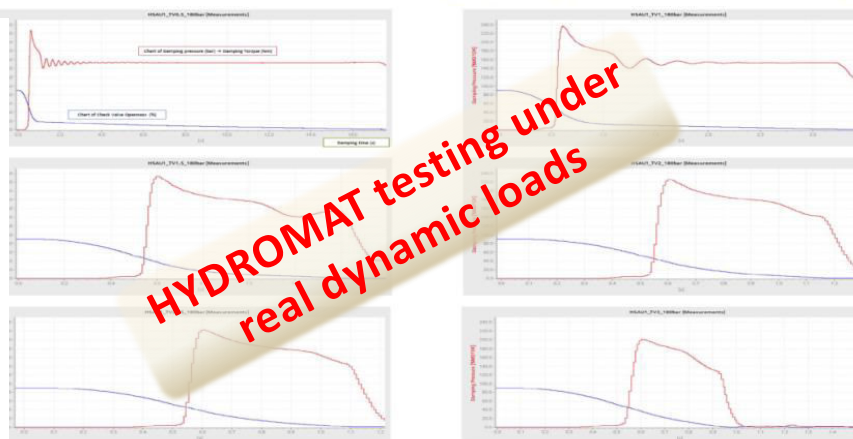
Oil filling and control

Upgrade options:

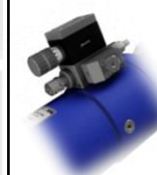
- With or without spring
- Hydraulic or pneumatic cylinders to obtain of the COMBINED CHECK VALVE

Main technical characteristic:

- Most reliable hydraulic system to download a very large of damping energy to 150 kJ
- Robust, compact and clean design of external surfaces with usage of quality materials, allows application in the most demanding work environments, including "outdoor" applications
- Initial start with spring or accumulator provides excellent dynamic to closing direction → high speed of damping process
- Closing time from full open to throttling position (30 to 40% of openness) $t > 0,5$ sec regardless of the size the shock absorbers
- Hydraulic damping, standard design by 3 stages, on request other combination
- Mounting in any position and under any inclination on the pipeline
- Equipping with hydraulic device or pneumatic cylinders, obtain of the COMBINED CHECK VALVE



HYDROMAT testing under real dynamic loads



Compact hydraulic control block provides the safety of hydraulic system and reliable damping control.

- Possibility to adjusting of damping characteristic:
- Only with throttle valve – cheaper version
 - Only with flow control valve – heavy duty damping systems
 - Combination by throttle and flow control valve – most common version
 - Other on request