



ACMO

VALVES and SERVICES for WATER WORLD

ATI
ACMO TECNOLOGIE
INTEGRATE

RAMIT Technologies S.R.L.

ACMO
divisione **SISTEMI**

ACQUA ENGINEERING
VNODV

SYSTEMS and TECHNOLOGIES for WATER WORLD

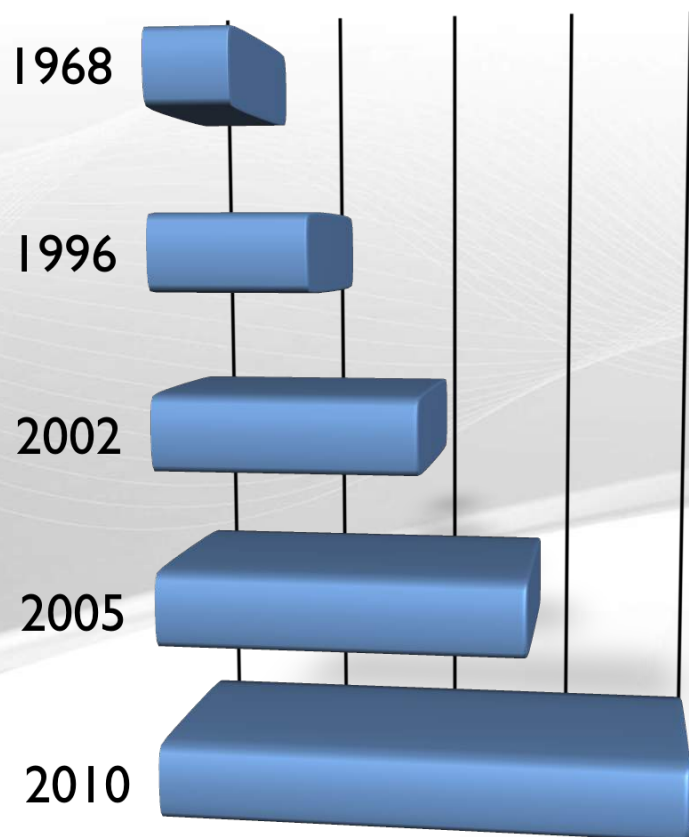
INTRODUCING ACMO FOR HYDROPOWER VALVES

Belgrade 05/11/2014

M.Sc. Eng. Cristiano Sebastiani

MORE THAN 40 YEARS OF EXPERIENCE

Since 1968 **ACMO WATER TECHNOLOGY** is committed in moving and controlling water.



ACMO

VALVES and SERVICES for WATER WORLD

□ design and manufacturing of valves for water applications

ACQUA ENGINEERING

□ engineering consulting for water projects

ACMO
divisione **SISTEMI**

□ after sale and maintenance services

ATI
ACMO TECNOLOGIE
INTEGRATE

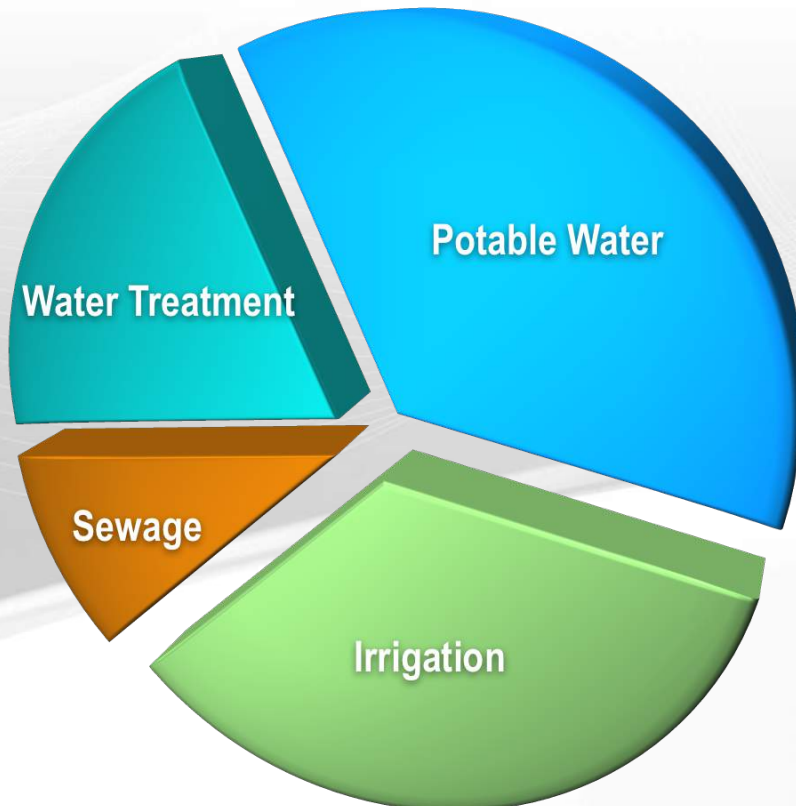
□ SCADA design and system integration for water projects

RAMIT
Technologies

□ smart water metering



ACMO WATER TECHNOLOGY is a leading global provider of solutions for the following areas:



APPLICATIONS

- ☐ Potable Water Intake
- ☐ Potable Water Distribution
- ☐ Irrigation Water Intake
- ☐ Irrigation Water Distribution
- ☐ Hydroelectric Power Generation
- ☐ Desalination
- ☐ Waste Water
- ☐ Industry



ACMO PRODUCT LINES

MAIN PRODUCT LINES OF ACMO WATER TECHNOLOGY

❑ ISOLATION VALVES

- ❑ Gate Valves
- ❑ Butterfly Valves

❑ CONTROL VALVES

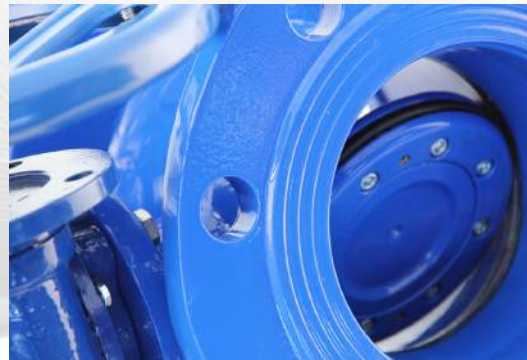
- ❑ Hydraulic Control Valves
- ❑ Needle Valves

❑ PIPELINE PROTECTION

- ❑ Air Valves
- ❑ Check Valves

❑ IRRIGATION

- ❑ Hydrants
- ❑ Metering Systems



SIEMENS

auma®
Solutions for a world in motion

ANIE
FEDERAZIONE
FEDERAZIONE NAZIONALE
IMPRESE ELETTROTECNICHE
ED ELETTRONICHE

AVR
VALVOLE E RUBINETTI

UNINDUSTRIA TREVISO
unione degli industriali della provincia di Treviso

TECHNOLOGICAL
PARTNERS

ASSOCIATIONS

CERTIFICATION



Panasonic®



WRAS
APPROVED
PRODUCT



- ☐ ISO 9001
 - ☐ Quality Management System
- ☐ ISO 14001
 - ☐ Environmental Management System
- ☐ WRAS
 - ☐ Gate valves & Butterfly valves
- ☐ PRODUCT CONFORMITY
 - ☐ Gate valves
 - ☐ Butterfly valves
 - ☐ Needle valves
 - ☐ Air valves



EUROPEAN NORMS FOR VALVES



Design Standards

EN 12516-1/4	Industrial Valves - Mechanical strength of the shell
EN 1092-1/2	Flanges and their joints
EN 19	Industrial Valves - Marking of metallic valves
EN 558	Industrial Valves - Face-to-face and centre-to-face dimensions of metal valves for use in flanged pipe systems.
EN 1349	Regulation valves for industrial processes



Testing Standards

EN 12266-1/2	Industrial Valves - Testing of valves
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Product Standards

EN 593	Industrial Valves - Metal butterfly valves
EN 1171	Industrial Valves - Cast iron gate valves
EN 1984	Industrial Valves - Gate valves in steel
EN 1074-1/4	Industrial Valves - Valves for water supply. Fitness for purpose requirements and appropriate verification tests



EUROPEAN NORMS FOR VALVES



European Directives

2006/42/CE

Machines Directive

97/23/CE

PED Directive



Potable Water Suitability

D.M. 174

Italian regulation for materials in contact with potable water

Ministry of Health

BS 6920

United Kingdom water supply regulations

WRAS



Documentation Standards

EN 10204

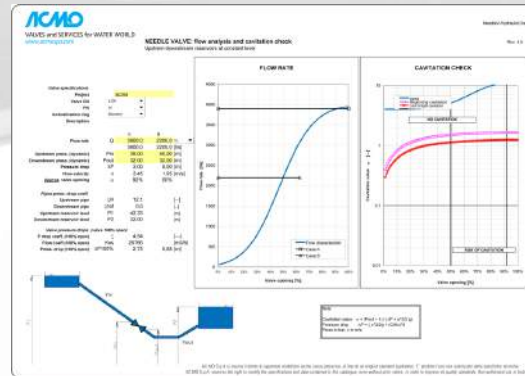
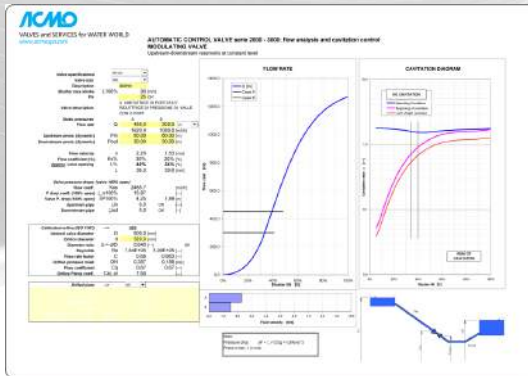
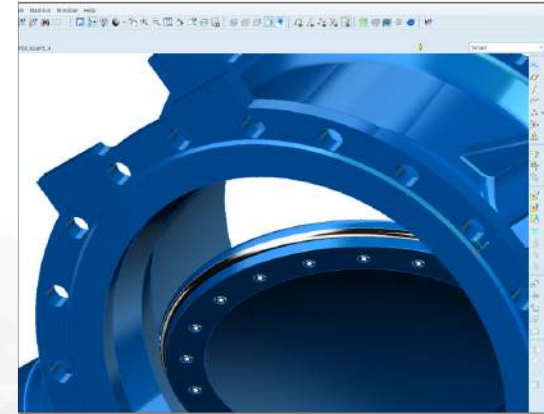
Metal products - Documents of control

EN 17050

Conformity assessment - Declaration from supplier

TECHNICAL DEPARTMENT DESIGN SOFTWARES

- ProEngineering 3D CAD software by PTC Creo Parametric Technologies
- AutoCad 2D CAD software by Autodesk
- Hydraulic sizing for control valves, needle valves and air valves



DOUBLE ECCENTRIC BUTTERFLY VALVE



MAIN FEATURES

- Application: potable water
- Design and manufacturing in accordance to most updated European Norms
- Complete range of production (DN 100 ÷ 3000)
- Allowable operating pressure (PFA) 10 – 16 – 25 – 40 bars
- Class A tightness according to EN 12266
- Automatic bi-directional sealing
- Fusion bonded coating with blue epoxy 300 micron suitable to be in contact with potable water in accordance to the specifications of the Italian Ministry of Health (Law D.M. 174) and the British Regulation BS6920
- Optimized and safe design
- Smaller overall dimensions
- Lighter weight



ACMO Double Eccentric Butterfly Valves have obtained the European Certificate of Conformity for diameter up to DN 2200 mm and allowable operating pressure up to 40 bars.

DOUBLE ECCENTRIC BUTTERFLY VALVE



DESIGN & MANUFACTURING STANDARDS

NORMS MANUFACTURING

- EN 593 METALLIC BUTTERFLY VALVES
- EN 1074-1 VALVES FOR WATER SUPPLY: GENERAL REQUIREMENTS
- EN 1074-2 VALVES FOR WATER SUPPLY: ISOLATING VALVES
- EN 558 S14 (& ISO 5752) FACE-TO-FACE DIMENSIONS
- EN 1092-2 (& ISO 7005) FLANGE DRILLING & DIMENSIONS

NORMS COMPONENT

- EN 1563 (& ISO 945) BODY
- EN 1563 (& ISO 945) DISC
- EN 681-1 (& ISO 4633-ISO9631) DISC SEAT
- EN 10088-1 SHAFT
- EN 1982 (& ISO 2624 – ISO 6509) BUSH

MATERIAL

- EN-GJS-500-7
- EN-GJS-500-7
- EPDM (OPT. NBR)
- AISI 420B (X20Cr13)
- G-CuSN5Zn5Pb2 BRONZE

NORMS TESTING

- EN 12266 (& ISO 5208) PRESSURE TEST CLASS 'A'

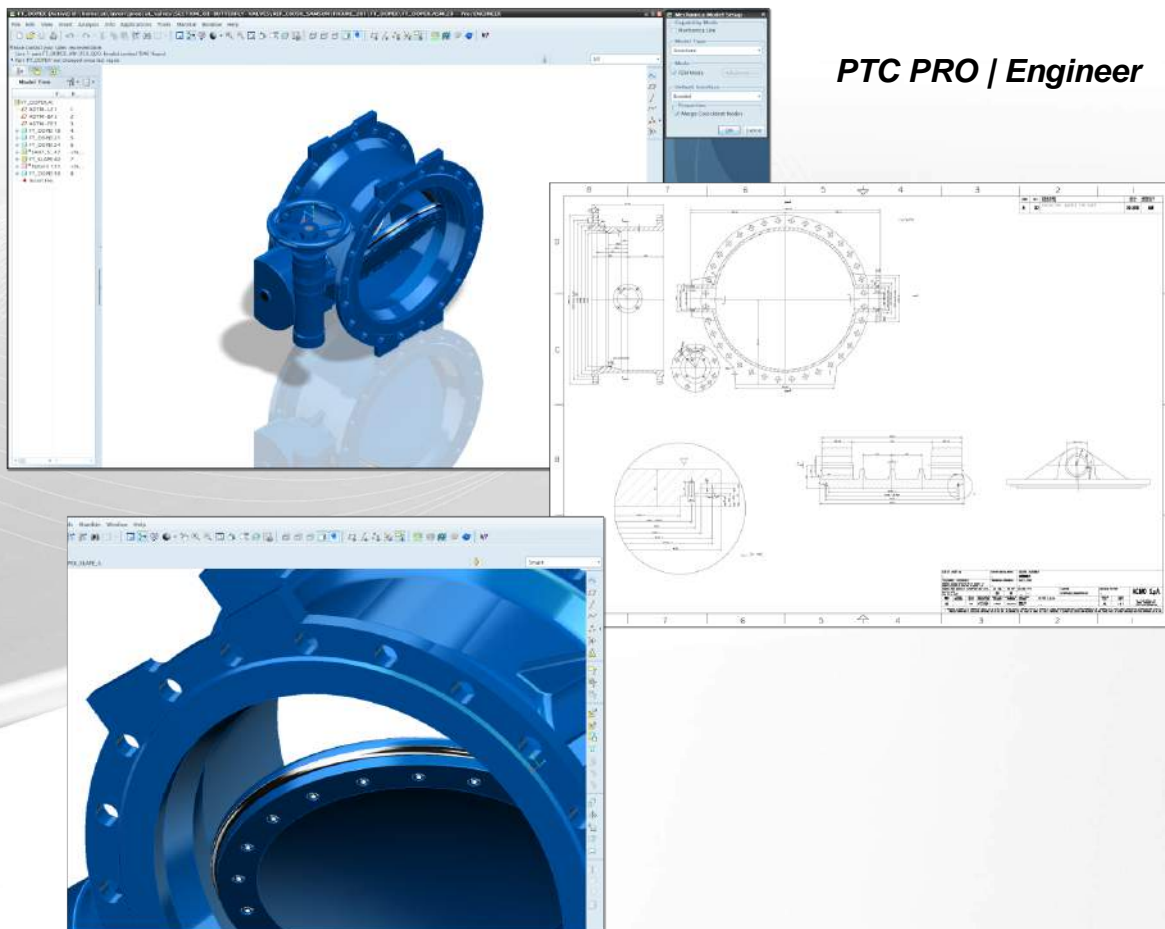


DOUBLE ECCENTRIC BUTTERFLY VALVE



RESEARCH & DEVELOPMENT

PTC PRO / Engineer



Butterfly valves with the highest quality standards are engineered and designed using the most advanced software for calculation, simulation and graphic development.

The know-how acquired by ACMO in more than 40 years of experience in valves world, allows our customers to have the support of a qualified technical department able to design sector-specific solutions .

DOUBLE ECCENTRIC BUTTERFLY VALVE

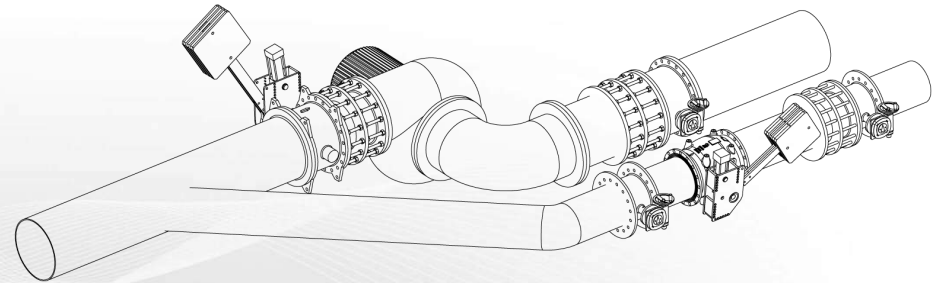


HYDROPOWER APPLICATION: TURBINE & BY-PASS VALVE

TURBINE VALVE

Following an appropriate and accurate sizing according to the hydraulic parameters of the system, the butterfly valve is used to protect the turbine.

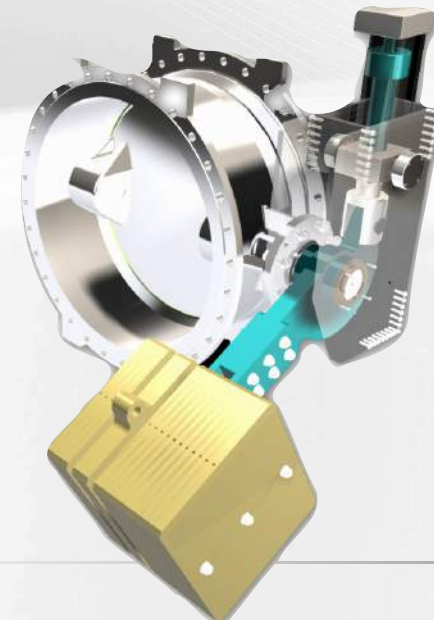
In case of unexpected power shut down, lever and counterweight close the disc of the valve.



BY-PASS VALVE

Following an appropriate and accurate sizing according to the hydraulic parameters of the system, the butterfly valve is used as a by-pass of the turbine.

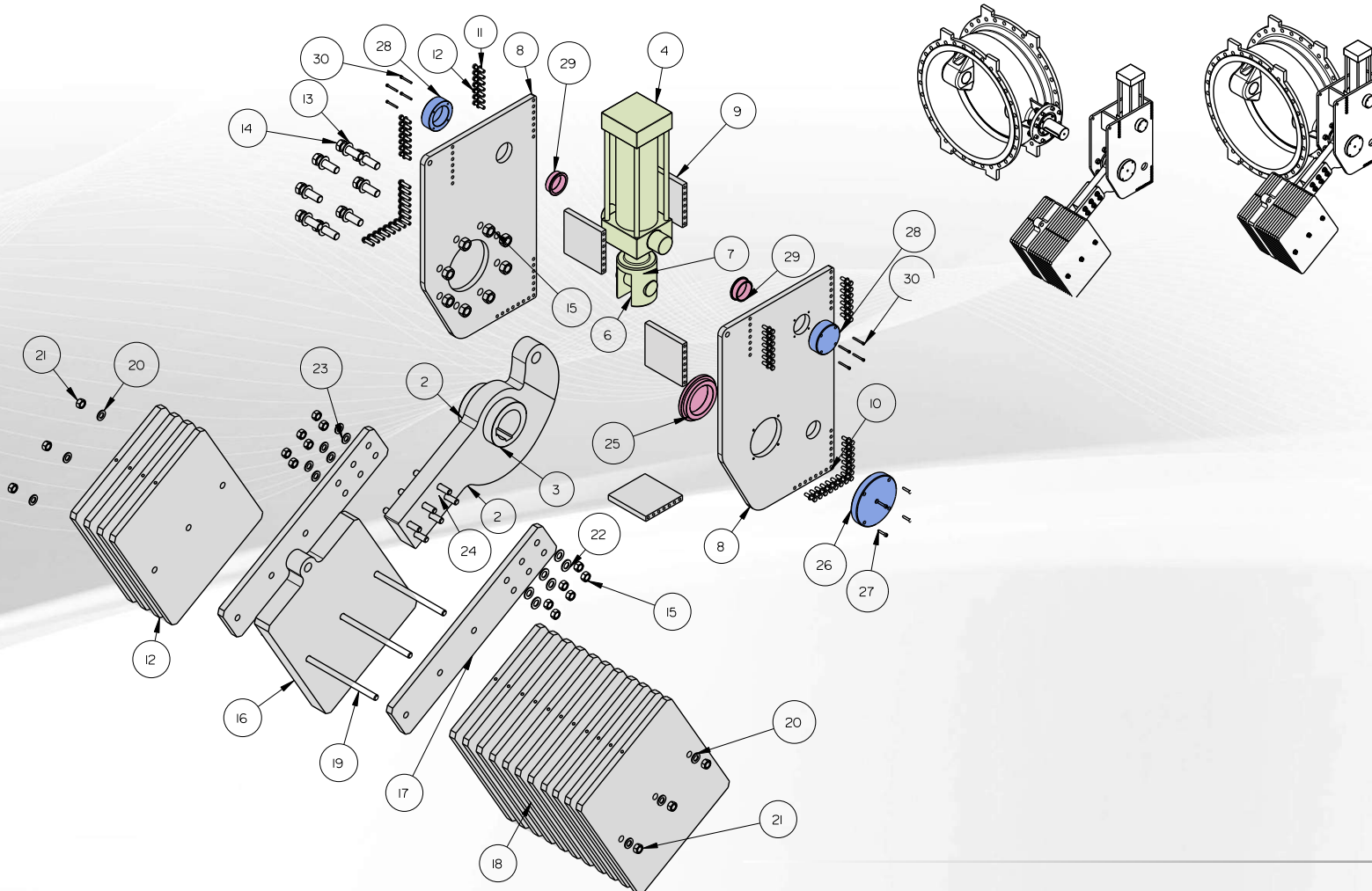
In case .



DOUBLE ECCENTRIC BUTTERFLY VALVE



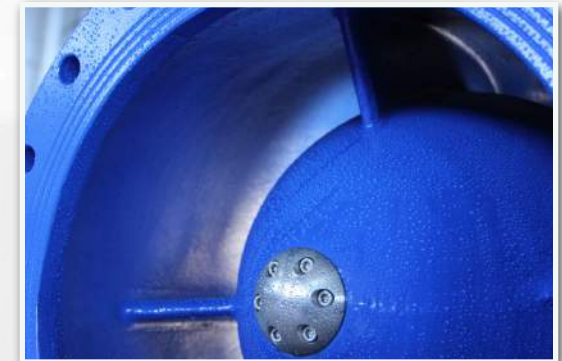
HYDROPOWER APPLICATION: HYDRAULIC CYLINDER, LEVER & COUNTERWEIGHT





MAIN FEATURES

- Application: potable water – industry – irrigation
- Design and manufacturing in accordance to most updated European Norms
- Complete range of production (DN 50 ÷ 1600)
- Allowable operating pressure (PFA) 10 – 16 – 25 – 40 – 64 – 100 bars
- Class A tightness according to EN 12266
- Piston closing and regulating mechanism
- Fusion bonded coating with blue epoxy 300 micron suitable to be in contact with potable water in accordance to the specifications of the Italian Ministry of Health (Law D.M. 174)
- Optimized and safer design
- Smaller overall dimensions
- Lighter weight



ACMO Needle Valves have obtained the European Certificate of Conformity.



DESIGN & MANUFACTURING NORMS

NORMS MANUFACTURING

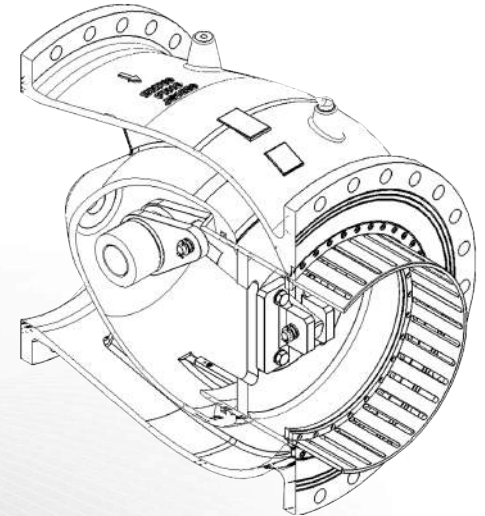
- EN 1074-1 VALVES FOR WATER SUPPLY
- EN 1074-5 REGULATING VALVES
- EN 558-1 S15 (ISO 5752) FACE TO FACE
- EN 1092-2 (ISO 7005-2) DRILLING FLANGES

NORMS COMPONENT

- EN 1563 (ISO 945) BODY
- EN 10088-3 OBTURATOR
- EN 10088-3 SEAT RING
- EN 10088-1 SHAFT
- EN 681-1 MAIN SEAL
- EN 10088-1 SPRING
- EN 10088-1 SCREWS

MATERIAL

- EN-GJS-500-7
- AISI304 (X5CrNi18-10) (OPT. AISI316)
- AISI304 (X5CrNi18-10) (OPT. AISI316)
- AISI420B (X20Cr13) (OPT. AISI316)
- POLYURETHANE TPU95
- AISI304 (A2-70)



NORMS TESTING

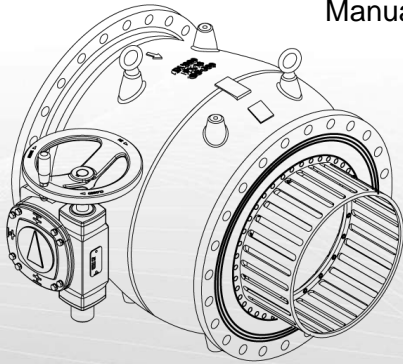
- EN 12266 (ISO 5208) PRESSURE TEST GRADE 'A'



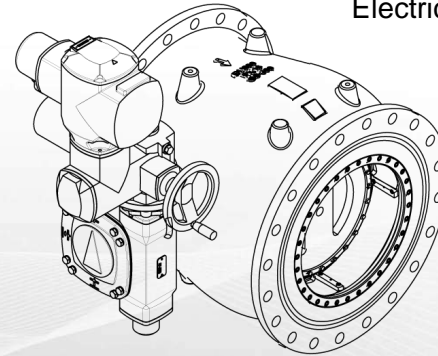


CONFIGURATIONS

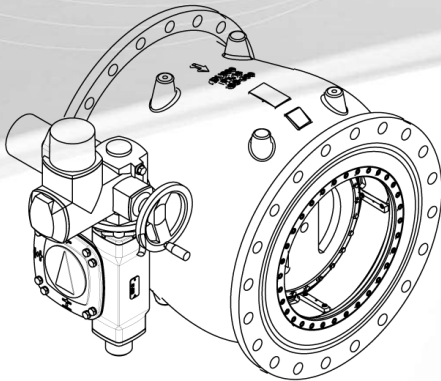
Manual operation



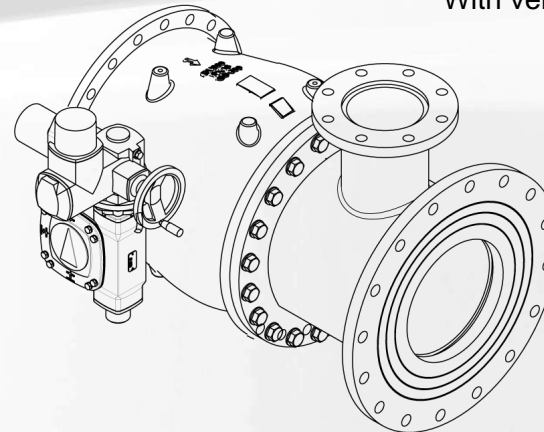
Electric operation with local control unit



Electric actuator operation



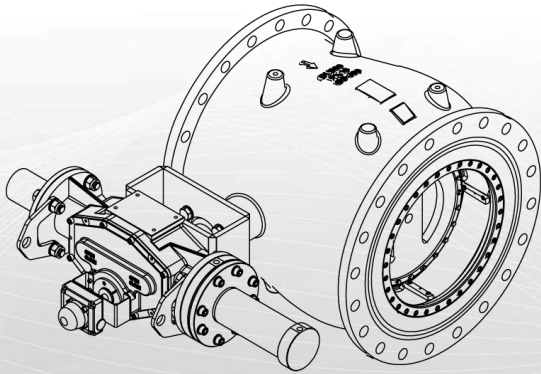
With venting device



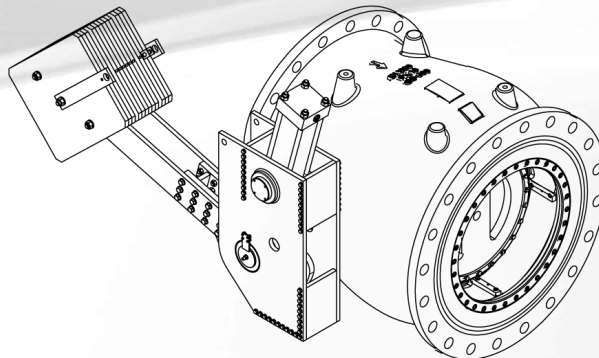
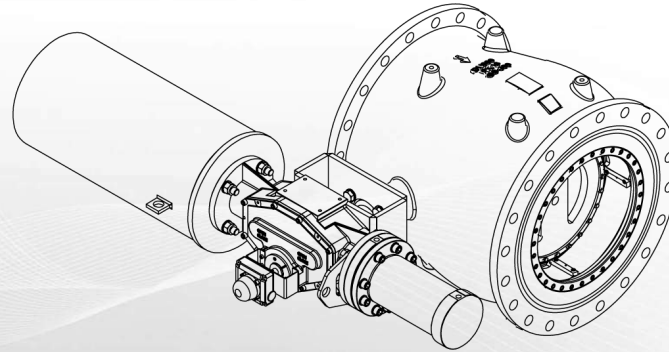


CONFIGURATIONS

Single acting hydraulic actuator operation



Double acting hydraulic actuator operation



With hydraulic cylinder, lever and counterweight



SOFTWARE FOR HYDRAULIC SIZING



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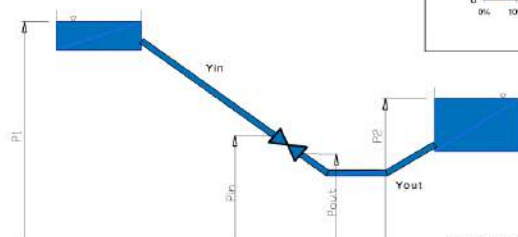
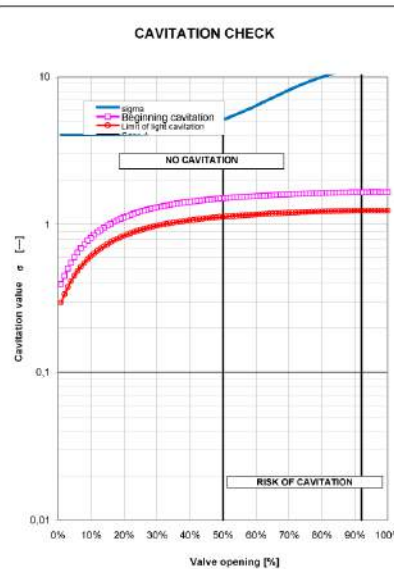
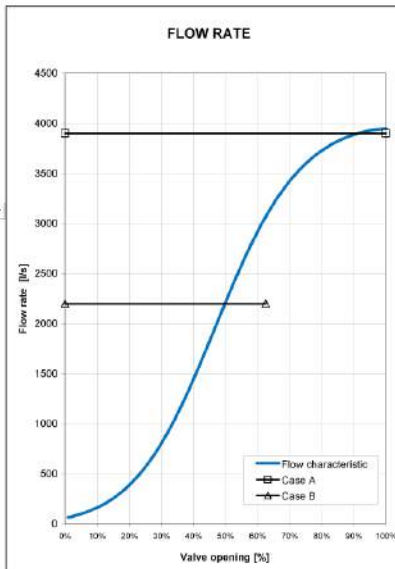
NeedleV-HydraulicChar

Rev. 4.0

NEEDLE VALVE: flow analysis and cavitation check

Upstream-downstream reservoirs at constant level

Valve specifications			
Project	acmo		
Valve DN	1200		
PN	16		
Anticavitation ring	Standard		
Description			
	A	B	
Flow rate	Q	3900.0	2200.0 [l/s]
		3900.0	
Upstream press. (dynamic)	P _{in}	35.00	40.00 [m]
Downstream press. (dynamic)	P _{out}	32.00	32.00 [m]
Pressure drop	ΔP	3.00	8.00 [m]
Flow velocity	v	3.45	1.95 [m/s]
Approx. valve opening	α	92%	50%
Pipes press. drop coeff.			
Upstream pipe	ξ _{in}	12.1	[-]
Downstream pipe	ξ _{out}	0.0	[-]
Upstream reservoir level	P1	42.33	[m]
Downstream reservoir level	P2	32.00	[m]
Valve pressure drops (valve 100% open)			
P drop coeff. (100% open)	ξ	4.54	[-]
Flow coeff (100% open)	Kvs	26766	[m ³ /h]
Press. drop (100% open)	ΔP100%	2.75	0.88 [m]



Note:
Cavitation value $\sigma = (P_{out} + 1) / (\xi P + v^2/2g)$
Pressure drop $\Delta P = \xi v^2/2g = (\xi/Kvs)^2$
Press in bar, v in m/s.

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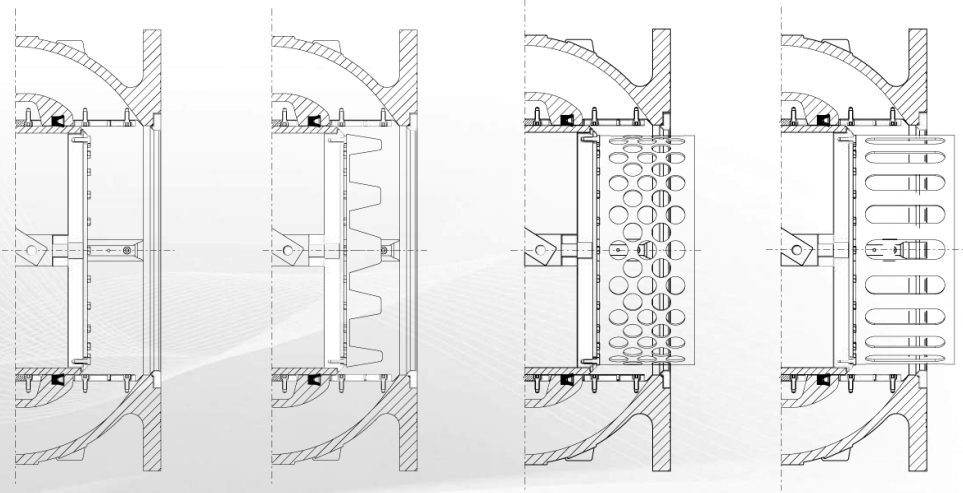


ACCESSORIES FOR CAVITATION PREVENTION: INTRUSIVE TYPE

According to hydraulic working conditions, the obturator shall be equipped with an additional stainless steel cylinder, designed with specific holes or eyelets.

This accessory allows to modulate the power dissipation within the valve, with the following results:

- to amend the regulation curve of the valve according to customer's requirement;
- to prevent cavitation.



PSEG

Standard
obturator

PSSG

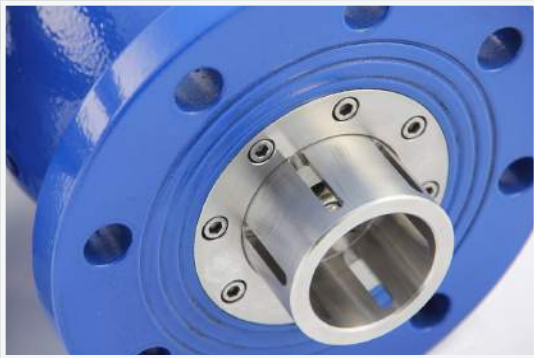
V-Port
obturator

PSLG

Obturator with
holes

PSLG10

Obturator
with eyelets

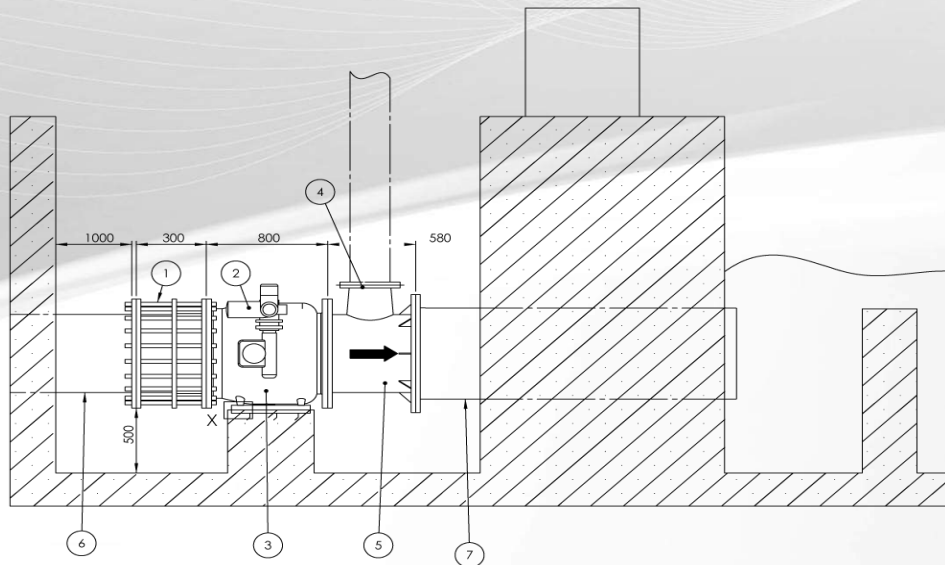
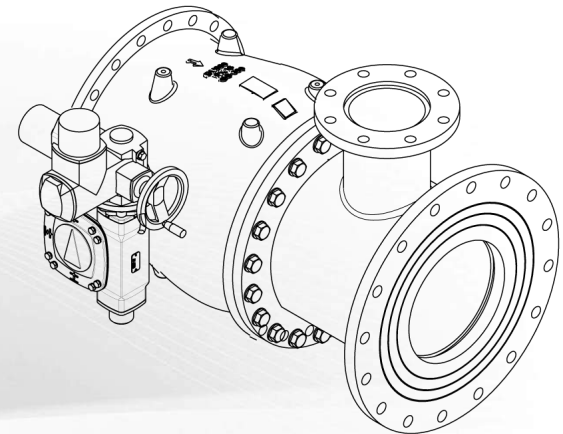




ACCESSORIES FOR CAVITATION PREVENTION: NON-INTRUSIVE TYPE

VENTING DEVICE

The device allows an air vacuum and has to be installed downstream of control valves in the presence of cavitation phenomena.



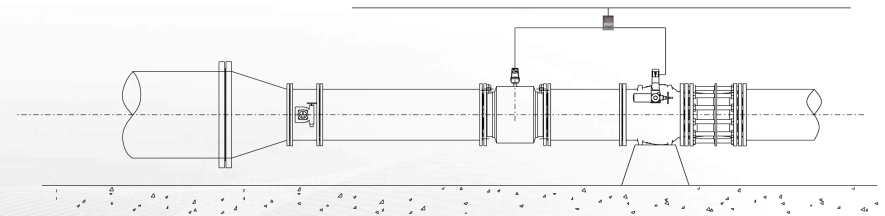
N	Description
1	dismantling joint (optional)
2	actuator + automatic
3	needle valve
4	flange connection DN250 PN16
5	venting pipe
6	DN600 pipe
7	DN700 pipe
8	clamping plate (optional)



STANDARD APPLICATION: FLOW & PRESSURE CONTROL VALVE

FLOW CONTROL VALVE

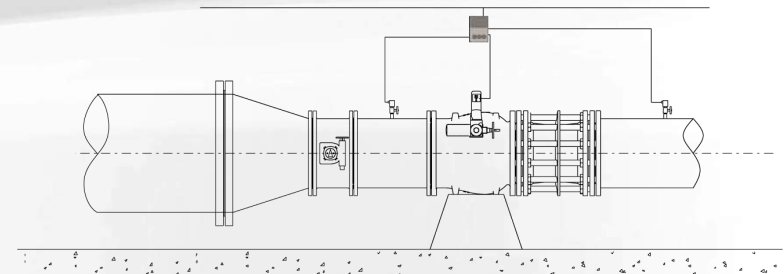
Following an appropriate and accurate sizing according to the hydraulic parameters of the system, the needle valve is used to control the flow. By changing the position of the obturator, it is possible to adjust the stream area in order to increase or decrease the flow according to the system demand.



PRESSURE MANAGEMENT

Following an appropriate and accurate sizing according to the hydraulic parameters of the system, the needle valve is used to control the pressure.

Pressure management is mostly required to reduce leakages in water distribution networks.





SOME REFERENCE

Project:

Izmir Water Supply

Location:

Turkey

Client:

DSI - General Directorate of State Hydraulic Works

End user:

Izmir Municipality

Products:

4x DN 1600 PN 10 REGFLUX Needle Valve

1x DN 1400 PN 16 REGFLUX Needle Valve

1x DN 1500 PN 16 Electromagnetic Flow Meter



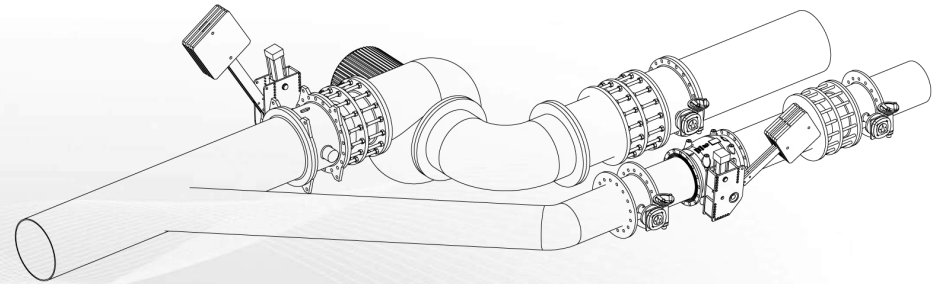


HYDROPOWER APPLICATION: BY-PASS VALVE

TURBINE BY-PASS

Following an appropriate and accurate sizing according to the hydraulic parameters of the system, the needle valve is used to by-pass the turbine, in case of damages or maintenance of the turbine.

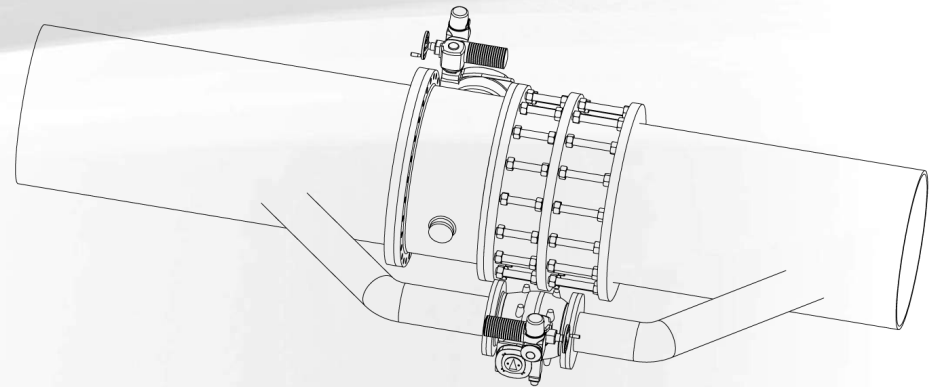
The opening/closing speed of the valve is adjustable.



BY-PASS FOR LARGE PIPELINES

Following an appropriate and accurate sizing according to the hydraulic parameters of the system, the needle valve is used as a by-pass in order to adjust the differential pressure of large pipeline during the filling.

The valve operate as a flow control valve.





SOME REFERENCE

Project:

Impianto DMV Fiastra & Talvacchia

Location:

Italy

Client:

Elettromeccanica Adriatica

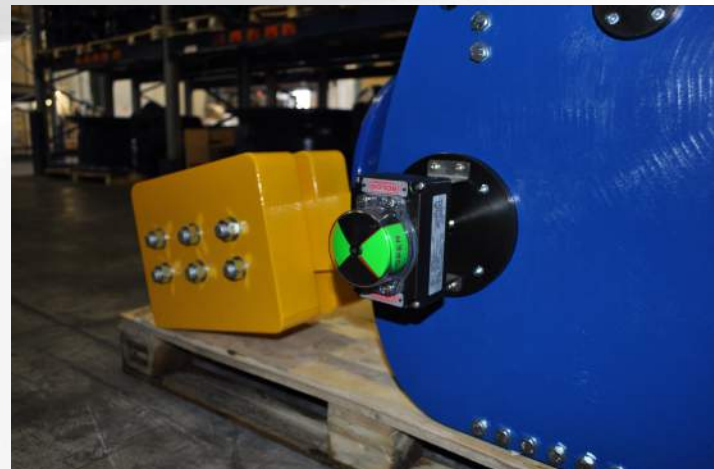
End user:

Enel

Products:

2x DN 300 PN 10 REGFLUX with lever & counterweight

2x DN 300 PN 10 DOPEX with lever & counterweight



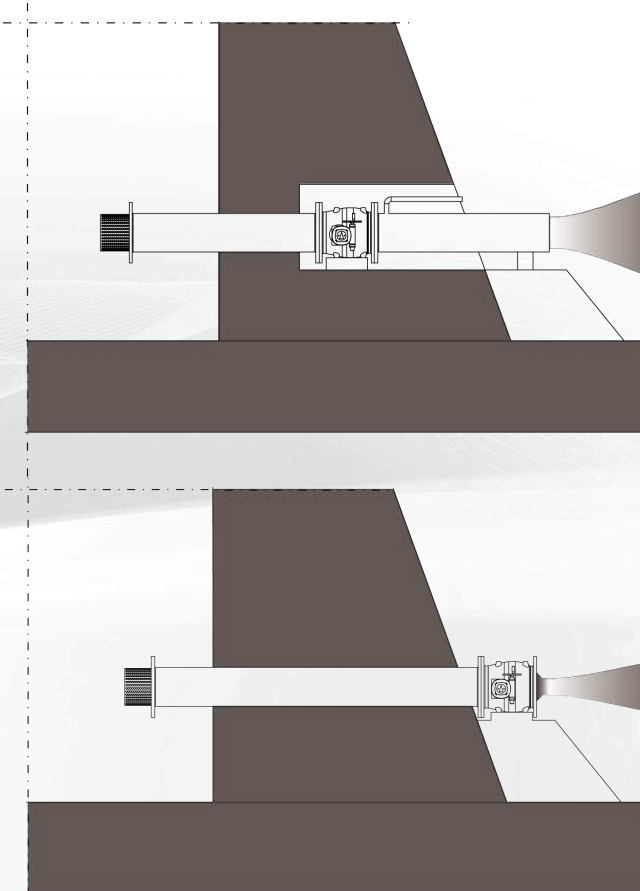


HYDROPOWER APPLICATION: DISCHARGE VALVE

DISSIPATION OF HIGH HYDROSTATIC PRESSURE

Following an appropriate and accurate sizing according to the hydraulic parameters of the system, the needle valve is used as a free discharge valve into the atmosphere.

A common installation is at the base of dams.



THANK YOU FOR YOUR ATTENTION

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