



Underground fire hydrants





The company was founded in 1987 by transforming the former CSA, which was a trading company dealing with pipes and valves for water networks, into a manufacturing company, through the research and realization of pillar fire hydrants. Since then many other products have been added.

The history of our company is characterised by years of technical and commercial research, which have enabled us to offer a complete range of valves designed for controlling, regulating and protecting the pipelines under pressure in both waterworks and sewage lines as well as fire hydrants.

Our many industrial patents and innovative technical solutions, together with modern and attractive style of design, have made it possible to differentiate our products from those offered by competitors and have allowed us to become a point of reference in our sector.

Flexibility and reliability have been the key points of CSA's rapid growth over the last few years. We are perfectly aware that we are managing the world's most precious resource and, motivated by this responsibility and the commitment towards our customers, we have dedicated ourselves to constantly improving our products, placing them at the highest levels of quality.

Quality

In the manufacturing business today, quality is the fundamental requirement for achieving and maintaining a growing market share.

For this reason we have always aimed at developing a synergy between the various sectors of the company and thus ensuring:

- quick and precise answers;
- evaluation of data received and immediate response;

- rigorous control of incoming and outgoing products.

Since 1998 CSA is certified according to regulation ISO 9001 by RINA (Italian Naval Registry) recently converted into ISO 9001/2008.





During the research and realisation of new products, CSA has always focused his efforts on:

- Listening to the customer's needs and finding the best solution both at the design and operational phases.
- Guiding our R&D department to develop ranges of modern, reliable and complementary products.
- Adopting production techniques that, even while complying with the severest quality standards, would allow us to reduce delivery times.
- Guaranteeing complete technical support for our customers and prompt after-sales assistance.

This philosophy characterizes us not only as a valve manufacturer but also as a reliable partner whom you can always depend on for consulting and solutions.

The production cycle, aimed at the constant improvement of our products and complete customer satisfaction, ensures predetermined margins of tolerance by establishing production standards, which guarantee that the semi-finished products reach the next production stage with the required specifications. All our valves are made of ductile cast iron GJS 400-15 / 500-7 in absolute compliance with European standards, and are suitable for PN 25-40 bar.

The manufacturing process is carried out exclusively by means of numerically controlled lathes, mills, and horizontal machining units. Subsequent step-by-step controls are based on strict quality procedures.

Painting, pre-treated by sand blasting grade SA 2.5, is carried out inside a fluidized bed containing epoxy powder, which guarantees maximum surface protection. All our products are tested under water pressure and certified.



Underground fire hydrants

The CSA underground fire hydrants series, designed in conformity with the applicable European standards, is composed of three models entirely manufactured in ductile cast iron and stainless steel with technical features to reach the highest standards in product safety and quality. Their design, production process and performances contribute to create a reliable product proudly made in Italy.



Mod. PLUTONE 500 DN 80 PN 16

This non-freezing compact underground fire hydrant model is equipped with screw or bayonet fitting, with a maximum height of 500 mm. The winged shaped obturator, anti-water hammer and anti-vibrations, allows the water discharge through the anti-freezing hole only when the hydrant is fully closed avoiding leakage and water loss, otherwise unavoidable by using different technologies such as flat shutters.



Mod. PLUTONE 700 DN 80 PN 16

This non-freezing compact underground fire hydrant model is equipped with screw or bayonet fitting, with a maximum height of 700 mm. The winged shaped obturator, anti-water hammer and anti-vibrations, allows the water discharge through the anti-freezing hole only when the hydrant is fully closed avoiding leakage and water loss, otherwise unavoidable by using different technologies such as flat shutters.



Mod. URANO DN 80 PN 16

This non-freezing underground fire hydrant model, equipped with screw or bayonet fitting, is supplied with up to 6 different heights of the barrel to meet the project requirements. The winged shaped obturator, anti-water hammer and anti-vibrations, allows the water discharge through the anti-freezing hole only when the hydrant is fully closed avoiding leakage and water loss, otherwise unavoidable by using different technologies such as flat shutters.

Technical features

1. Overall painting

To guarantee the best resistance against corrosion and in compliance with potable water requirements all CSA hydrants are subject to internal and external painting, more precisely black epoxy paint or blue RAL 5005 polyester powder applied through fluidized bed technology.

2. Internal components in stainless steel

All internals are manufactured in stainless steel and protected from contact with the ductile iron by means of components in bronze and brass.

3. Anti-friction technology

All components involved in the movement and rotation are designed to reduce friction and interferences as much as possible, in addition to innovative technical solutions, in order to reduce torque and excessive wearing.

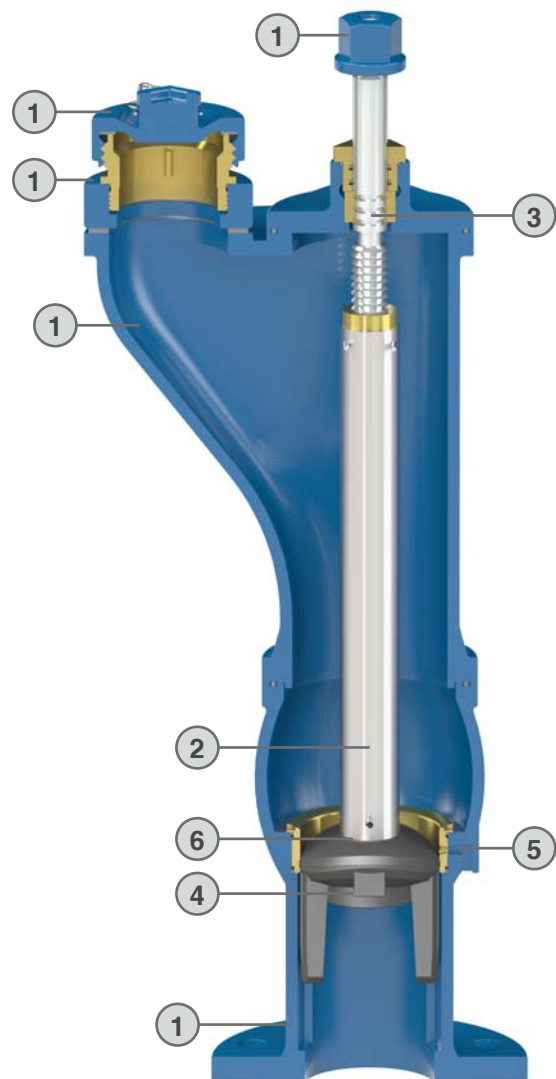
4. Obturator anti-water hammer and anti-vibration (see page 7)

5. Anti-freezing drainage hole

In case of low temperatures, with risk of frost, it is necessary to allow the complete drainage of the hydrant once the closed position has been reached. CSA manufactures all hydrants with anti-freezing drainage hole obtained on the sealing ring, onto which the rubber coating of the obturator is acting, embedded inside the base either supplied with a duck foot bend or vertical connection.

6. Safety system of the obturator

The water tightness on CSA hydrants is obtained by the compression of the rubber coating of the obturator, made in ductile cast iron, against the sealing ring housed inside the lower base either supplied as a duck foot bend or vertical connection. This solution avoids excessive wearing and frequent maintenance, as well as reducing the torque necessary for the complete closure. Should the latter be excessive, an innovative construction detail will prevent under any circumstances any possible damage to the obturator mobile block.



Obturator

The CSA obturator, manufactured in ductile cast iron fully coated with NBR vulcanized or EPDM, is a winged shaped cone performing a perfect water tightness by means of the compression of its cylindrical part against the sealing ring housed inside the base of the hydrant, either duck foot bend or vertical connection. The coating is applied on three different layers where the one in the middle closes the anti-freezing drainage hole, while the two remaining will prevent any kind of vibration.

This design allows:

- a water tightness in presence of high pressure values, even higher than 25 bar;
- the absence of any kind of interference with foreign materials that can enter the hydrant;
- a gradual variation of low and pressure during opening and closing, preventing unwanted water hammer events and/or sudden drop in pressure.

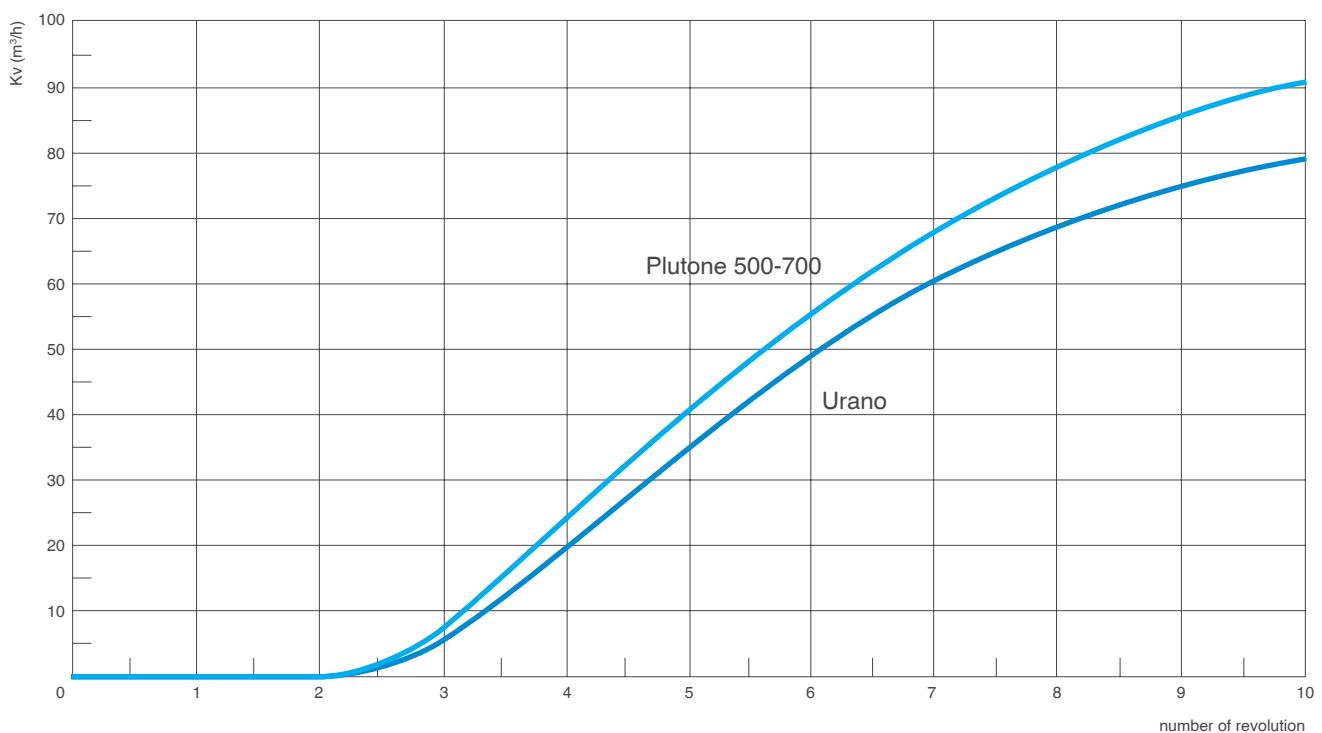


Water leakage and loss reduction

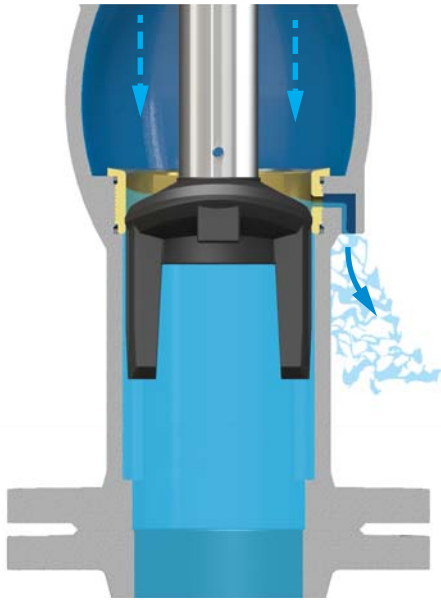
The winged shaped obturator will avoid, under any circumstances, to put in communication the drainage anti-freezing hole with the upstream pressure, which is happening all the time during the usage of the hydrant and the manoeuvres with flat disks and technologies not equivalent to CSA. When that occurs huge amounts of water are wasted through concealed water loss.

Flow rate curve

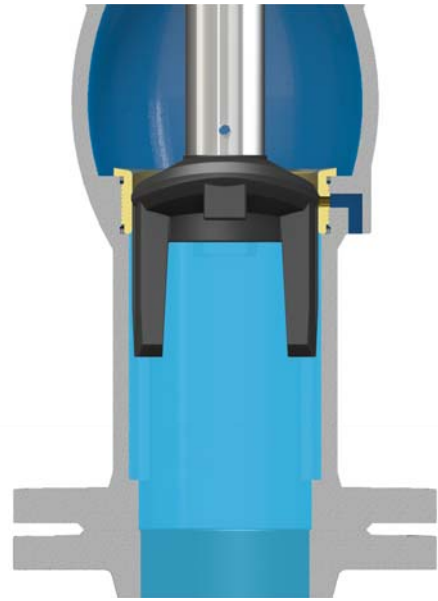
The following chart is showing the variation of the Kv, expressed in m³/h, versus number of revolutions required to open the hydrant for models Plutone and Urano. The results are considering a draw off from a UNI 70 fitting.



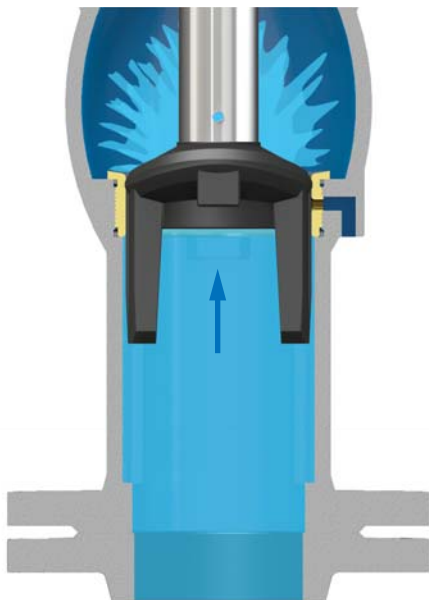
Operating principle



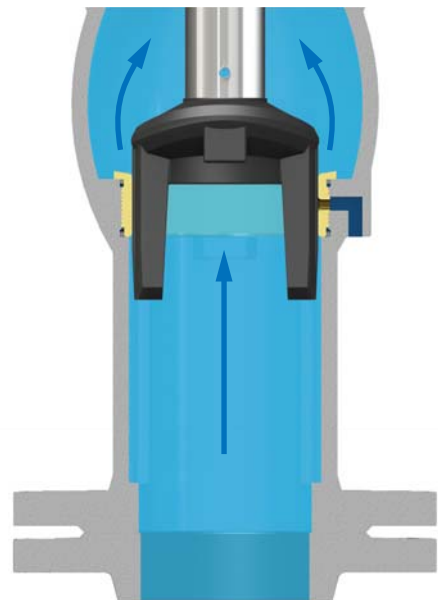
1. Obturator to the fully closed position.
Perfect water tightness with the drainage anti-freezing hole fully open.
 Water trapped inside the pillar fire hydrant pours out of the drainage hole avoiding possible damages caused by frost.



2. Obturator to the initial opening phase.
Perfect water tightness. The drainage hole is closed before putting the upstream pressure in communication with the hydrant.



3. Obturator to the intermediate opening phase.
Flow rate increasing gradually. The drainage hole is always closed as the obturator is progressing upwards.



4. Obturator to the fully open position.
Flow rate through the hydrant and to the outlets has reached the maximum value, the drainage anti-freezing hole is always closed. Absence of vibrations thanks to the winged shaped obturator.

Underground fire hydrant Mod. Plutone 500

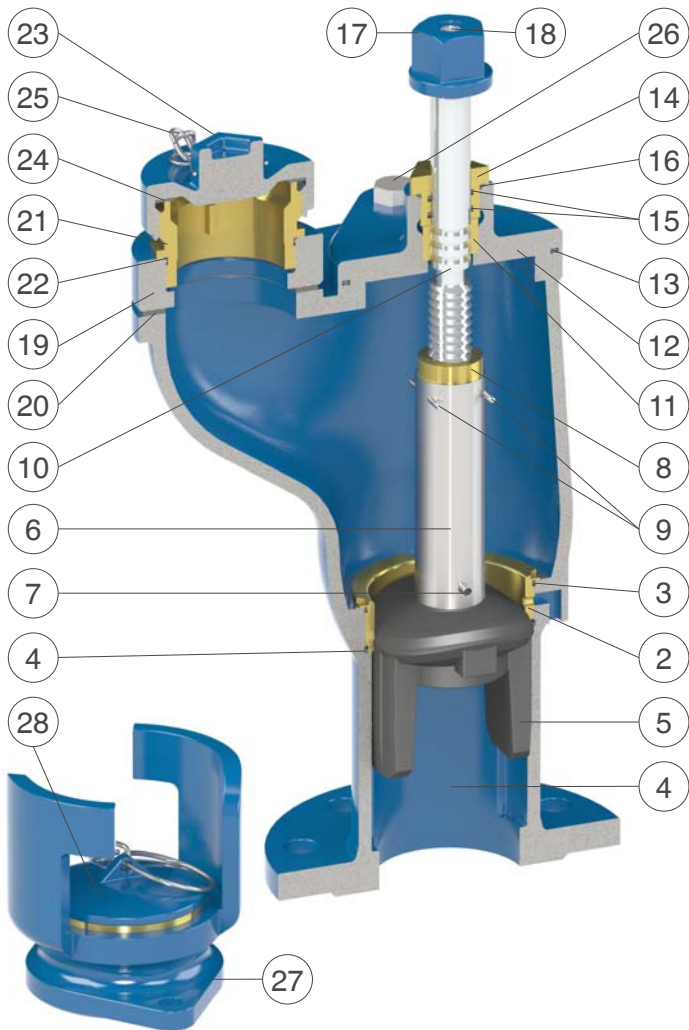
The CSA underground fire hydrant Mod. PLUTONE 500, completely made in ductile cast iron and stainless steel, has been specifically designed for the highest quality standards and long lasting performances. The compact execution with built in anti-freezing drainage system makes it suitable also in areas and locations subject to frost.



Technical features and benefits

- In compliance with the applicable EN standards.
- Compact design with a maximum height of 500 mm.
- Upper and lower bodies in ductile cast iron to guarantee the maximum safety also in case of overpressure and unexpected water hammer events. Internal components in stainless steel.
- The obturator, manufactured in ductile cast iron and covered in vulcanized EPDM, has been studied to reduce water hammer effects and vibrations during closure, and consequently sudden drop in pressure during opening. This is due to the particular conical winged shape and the special housing obtained inside the lower body.
- The sealing is obtained by means of the compression of the rubber of the obturator against the ring in bronze, properly machined with the drainage hole and threaded on the lower part of the hydrant. In comparison with other designs, where a simple flat disk is closing on the metal, CSA solution increases dramatically the reliability and safety assuring a perfect water tightness also in case of high pressure values.
- Anti-leakage system thanks to the winged shape design of the obturator, allowing the water discharge through the drainage anti-freezing hole only when the hydrant is fully closed. During opening and movement of the obturator, in fact, the inlet upstream pressure will never be in contact with the drainage hole ensuring a real anti-leakage system which can never be obtained with flat shutters.
- Painting is carried out by potable water approved epoxy powders, to guarantee the uniform thickness inside and outside of the hydrant with the best quality and durability of coating.

Technical details



N.	Component	Material
1	Body	GJS 500-7
2	Sealing ring	bronze
3	O-ring gasket	NBR
4	O-ring gasket	NBR
5	Wedge	GJS 500-7 and NBR
6	Stand pipe	stainless steel
7	Cotter pin	stainless steel
8	Threaded part	bronze
9	Pins	stainless steel
10	Upper stem	stainless steel
11	Anti-friction washer	brass
12	Bonnet	GJS 500-7
13	O-ring gasket	NBR
14	Hold down nut	brass
15	O-ring gaskets	NBR
16	O-ring gasket	NBR
17	Operating nut	GJS 500-7
18	TCEI screw	stainless steel
19	Connection flange	GJS 500-7
20	Plane gasket	neoprene
21	Fitting	brass
22	O-ring gasket	NBR
23	DN 70 tap	GJS 500-7
24	Plane gasket	neoprene
25	Chain	stainless steel
26	Nuts and bolts	stainless steel
27	Bayonet fitting	GJS 500-7
28	Tap	GJS 500-7

The list of materials and components is subject to changes without notice.

Working conditions

Treated water max. 70°C.

Pressure testing

Test of mechanical resistance with obturator fully open at 25 bar.

Test of mechanical resistance with obturator fully closed at 20 bar.

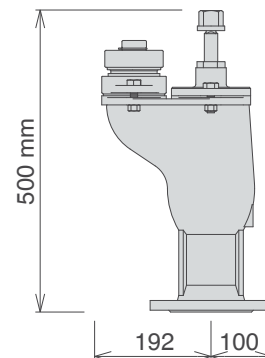
Standard

Designed in compliance with EN 1074/6 and EN 14339.

Flanges according to EN 1092/2.

Epoxy painting applied through fluidized bed technology blue RAL 5005.

Variations on flanges and painting available on request.



Underground fire hydrant Mod. Plutone 700

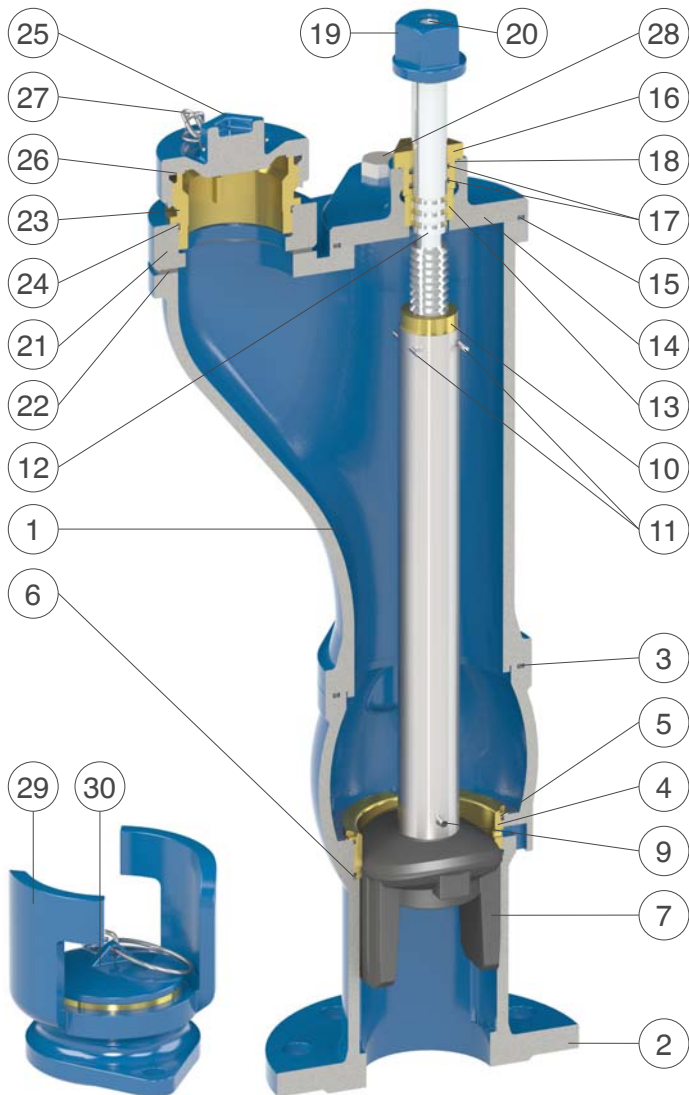
The CSA underground fire hydrant Mod. PLUTONE 700, completely made in ductile cast iron and stainless steel, has been specifically designed for the highest quality standards and long lasting performances. The execution with built in anti-freezing drainage system makes it suitable also in areas and locations subject to frost.



Technical features and benefits

- In compliance with the applicable EN standards.
- Compact design with a maximum height of 700 mm.
- Upper and lower bodies in ductile cast iron to guarantee the maximum safety also in case of overpressure and unexpected water hammer events. Internal components in stainless steel.
- The obturator, manufactured in ductile cast iron and covered in vulcanized EPDM, has been studied to reduce water hammer effects and vibrations during closure, and consequently sudden drop in pressure during opening. This is due to the particular conical winged shape and the special housing obtained inside the lower body.
- The sealing is obtained by means of the compression of the rubber of the obturator against the ring in bronze, properly machined with the drainage hole and threaded on the lower part of the hydrant. In comparison with other designs, where a simple flat disk is closing on the metal, CSA solution increases dramatically the reliability and safety assuring a perfect water tightness also in case of high pressure values.
- Anti-leakage system thanks to the winged shape design of the obturator, allowing the water discharge through the drainage anti-freezing hole only when the hydrant is fully closed. During opening and movement of the obturator, in fact, the inlet upstream pressure will never be in contact with the drainage hole ensuring a real anti-leakage system which can never be obtained with flat shutters.
- Painting is carried out by potable water approved epoxy powders, to guarantee the uniform thickness inside and outside of the hydrant with the best quality and durability of coating.

Technical details



N.	Component	Material
1	Upper body	GJS 500-7
2	Lower body	GJS 500-7
3	O-ring gasket	NBR
4	Sealing ring	bronze
5	O-ring gasket	NBR
6	O-ring gasket	NBR
7	Wedge	GJS 500-7 and NBR
8	Stand pipe	stainless steel
9	Cotter pin	stainless steel
10	Threaded part	bronze
11	Pins	stainless steel
12	Upper stem	stainless steel
13	Anti-friction washer	brass
14	Bonnet	GJS 500-7
15	O-ring gasket	NBR
16	Hold down nut	brass
17	O-ring gaskets	NBR
18	O-ring gasket	NBR
19	Operating nut	GJS 500-7
20	TCEI screw	stainless steel
21	Connection flange	GJS 500-7
22	Plane gasket	neoprene
23	Fitting	brass
24	O-ring gasket	NBR
25	DN 70 tap	GJS 500-7
26	Plane gasket	neoprene
27	Chain	stainless steel
28	Nuts and bolts	stainless steel
29	Bayonet fitting	GJS 500-7
30	Tap	GJS 500-7

The list of materials and components is subject to changes without notice.

Working conditions

Treated water max. 70°C.

Pressure testing

Test of mechanical resistance with obturator fully open at 25 bar.

Test of mechanical resistance with obturator fully closed at 20 bar.

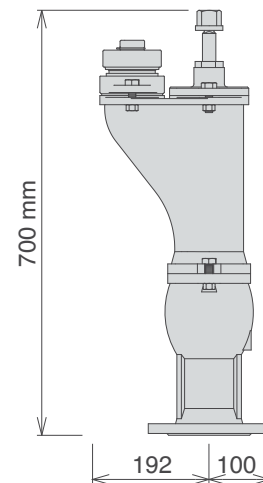
Standard

Designed in compliance with EN 1074/6 and EN 14339.

Flanges according to EN 1092/2.

Epoxy painting applied through fluidized bed technology blue RAL 5005.

Variations on flanges and painting available on request.





Underground fire hydrant Mod. Urano

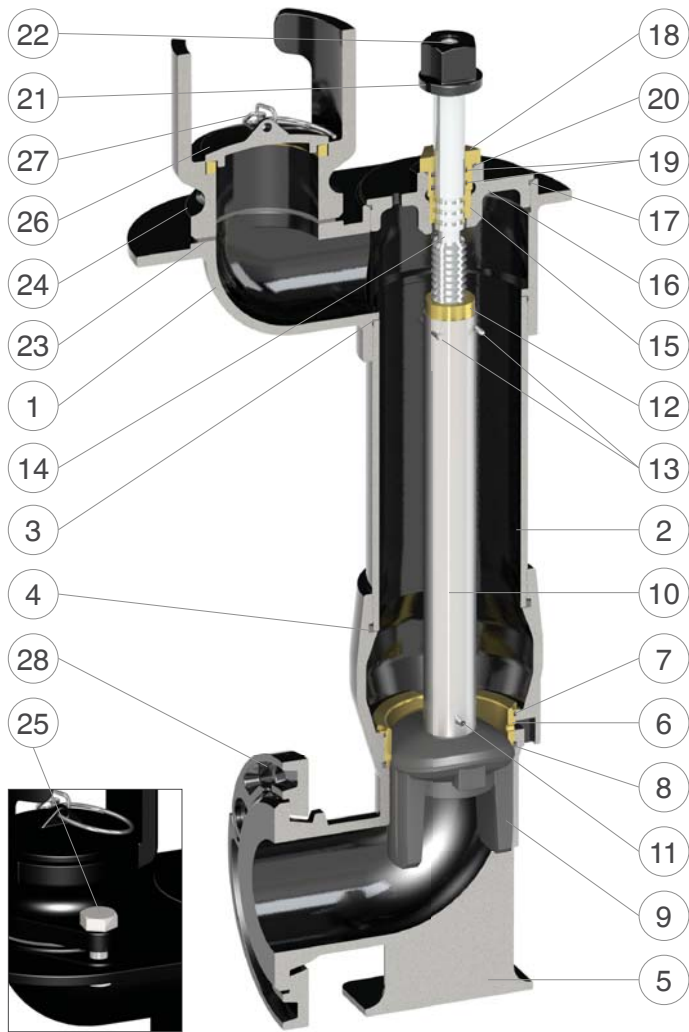
The CSA underground fire hydrant Mod. URANO, completely made in ductile cast iron and stainless steel, has been specifically designed for the highest quality standards and long lasting performances. The execution with different heights and built in anti-freezing drainage system makes it suitable also in areas and locations subject to frost.



Technical features and benefits

- In compliance with the applicable EN standards.
- Main pipe, upper body and duck foot bend in ductile cast iron to guarantee the maximum safety also in case of overpressure and unexpected water hammer events. Internal components in stainless steel.
- The obturator, manufactured in ductile cast iron and covered in vulcanized EPDM, has been studied to reduce water hammer effects and vibrations during closure, and consequently sudden drop in pressure during opening. This is due to the particular conical winged shape and the special housing obtained inside the duck foot bend.
- The sealing is obtained by means of the compression of the rubber of the obturator against the ring in bronze, properly machined with the drainage hole and threaded on the lower part of the hydrant. In comparison with other designs, where a simple flat disk is closing on the metal, CSA solution increases dramatically the reliability and safety assuring a perfect water tightness also in case of high pressure values.
- Anti-leakage system thanks to the winged shape design of the obturator, allowing the water discharge through the drainage anti-freezing hole only when the hydrant is fully closed. During opening and movement of the obturator, in fact, the inlet upstream pressure will never be in contact with the drainage hole ensuring a real anti-leakage system which can never be obtained with flat shutters.
- Painting is carried out by potable water approved epoxy powders, to guarantee the uniform thickness inside and outside of the hydrant with the best quality and durability of coating.

Technical details



N.	Component	Material
1	Upper body	GJS 500-7
2	Barrel	steel
3	O-ring gasket	NBR
4	O-ring gasket	NBR
5	Duck foot bend	GJS 500-7
6	Sealing ring	bronze
7	O-ring gasket	NBR
8	O-ring gasket	NBR
9	Wedge	GJS 500-7/NBR
10	Stand pipe	stainless steel
11	Cotter pin	stainless steel
12	Threaded part	bronze
13	Pins	stainless steel
14	Upper stem	stainless steel
15	Anti-friction washer	brass
16	Bonnet	GJS 500-7
17	O-ring gasket	NBR
18	Hold down nut	brass
19	O-ring gaskets	NBR
20	O-ring gasket	NBR
21	Operating nut	GJS 500-7
22	TCEI screw	stainless steel
23	Plane gasket	neoprene
24	Bayonet fitting	GJS 500-7
25	Nuts and bolts	stainless steel
26	Tap	GJS 500-7
27	Chain	stainless steel
28	Adjustable flanges	GJS 500-7

The list of materials and components is subject to changes without notice.

Working conditions

Treated water maximum 70°C.

Pressure testing

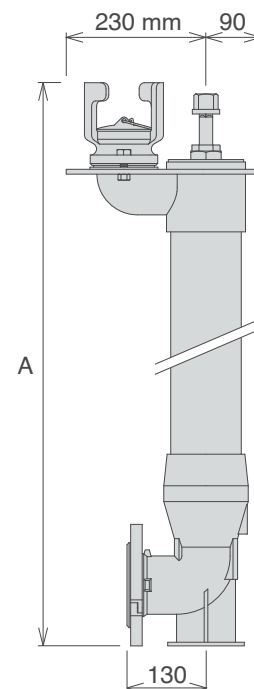
Test of mechanical resistance with obturator fully open at 25 bar.

Test of mechanical resistance with obturator fully closed at 20 bar.

Standard

Designed in compliance with EN 1074/6 and EN 14339. Flanges according to EN 1092/2. Black epoxy painting. Available in different heights of the underground barrel. Different painting, flanges and height on request.

Model	A mm	Connection	Flange	Weight Kg
DN 80A	650	DN 70		31
DN 80B	850	threaded	DN 80	37
DN 80C	1150	or	PN 16	44
DN 80D	1400	DN 70 bayonet		51



Accessories



The **S regulating bend** has been designed to allow a complete rototranslation for the proper alignment of the hydrant connection with the lead from the water main line.

Entirely built in ductile cast iron, black or blue epoxy painted, and fully orientable with a centre to centre distance of 500 mm, the CSA S regulating bend allows for the proper installation with a dramatic reduction of costs. Flanges in accordance with EN 1092-2.

DN	A mm	B mm	PN bar	Weight Kg
80	500	350	16	12
100	500	350	16	16



Duckfoot bend. Angle pattern ductile cast iron foot bend black epoxy or blue epoxy painted. Flanges in accordance with EN 1092-2.



Manoeuvring pentagonal manhole key. Made in ductile cast iron GJS 500/7 and welded on a iron rod.



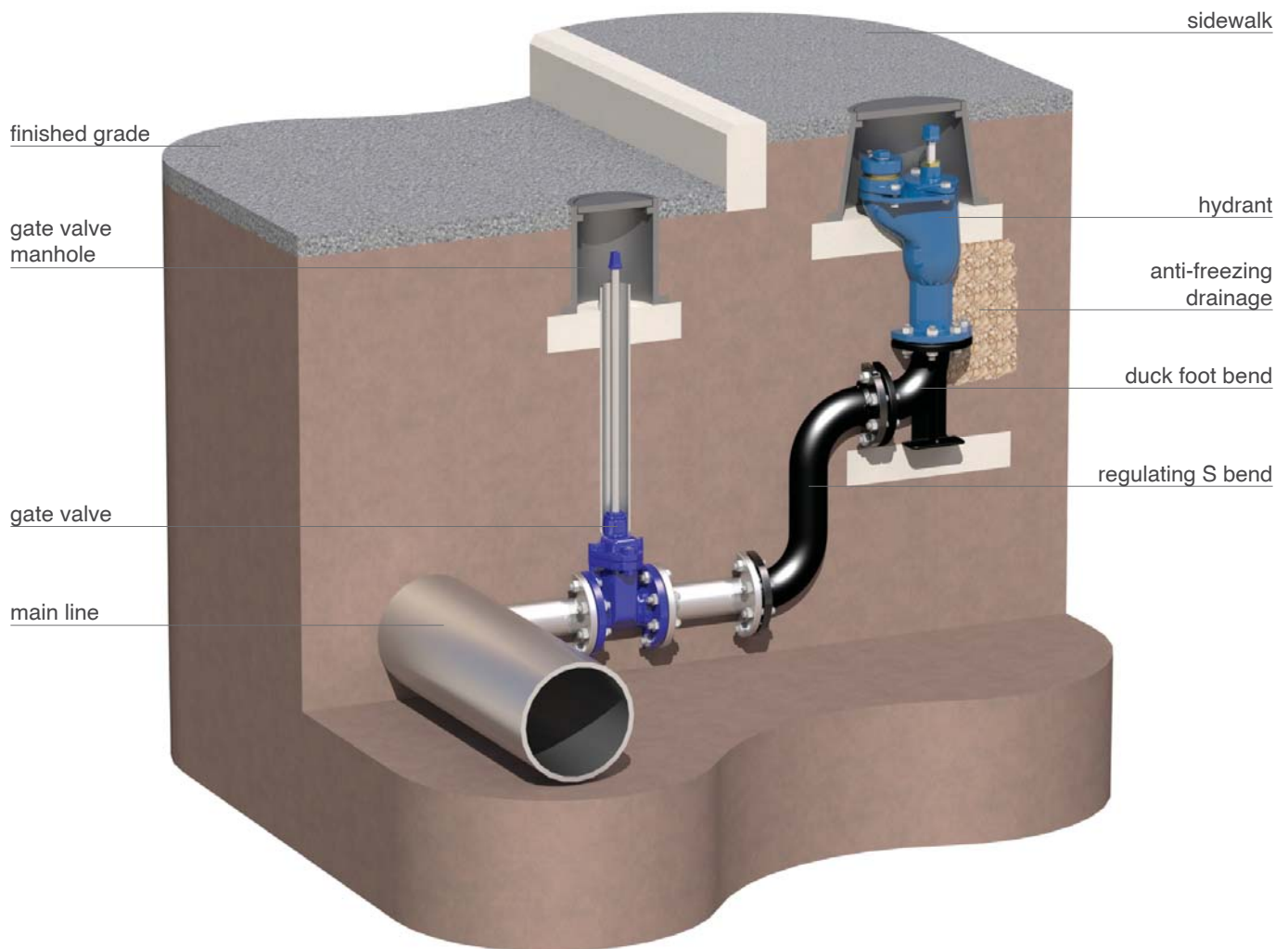
Oval manhole. Entirely built in ductile cast iron and equipped with an anti-slip cover.

Maintenance

CSA hydrants do not require frequent maintenance, nevertheless we recommend to follow the instruction provided with operation and installation manuals and technical advises explained in this catalogue.

Users are invited to check the proper functioning by opening and closing the hydrant at least 3 times per year.

Installation



Inspect the hydrant prior to installation in order to check for damage during shipment. In the event that storage is necessary please contact CSA and inspect just before installation. Before installing the hydrant clean up pipes, gate valves, fittings from debris and sands, remove any foreign matter that could enter the hydrant and affect its performance during operation.



Warning: Hydrants should not be use as tool for flushing pipes, in such case the rubber coating of the obturator would be likely to be torn or scratched by stones, pebbles and foreign material with possible leakage.

- An isolation device must be installed on the hydrant lead between the hydrant and the water main to permit maintenance and emergency shut-off purposes.
- Set the hydrant using a solid footing such as stone slabs or a concrete base in order to prevent settling and strain on the hydrant connection and consequently the water main.
- The anti-freezing drain hole should be surrounded by stones, or pouring directly to the sewage line. Failing in doing so and leaving it buried will prevent it from operating properly.



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