GLOBE VALVES CATALOGUE

FCA LGS, LPS AND LPY MODEL GLOBE VALVES

BS 1873 / API 602 AND ASME B16.34 DESIGNS
ASME CLASSES 150#, 300#, 600#, 900# AND 1500#.
SIZES FROM 2'' UP TO 16''.

FCA®
FLOW CONTROL APPLICATIONS

FLOW CONTROL APPLICATIONS

FCA - WORKING CLOSELY WITH YOU TO ACHIEVE EXCELLENCE

Even with the most careful and meticulous planning, the success of a project can only be assured with good execution after the contract is signed. **FCA** team of engineering designers, production specialists, logistics experts and process engineers, plays its role to ensure quality products, timely delivery, smooth start-up and plant optimization.

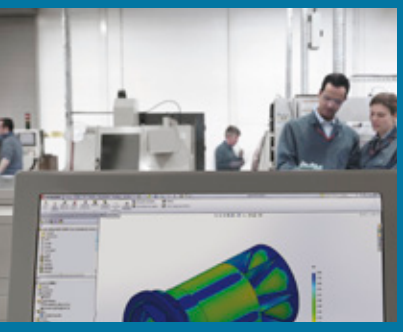
More and more customers trust our DNV certified solutions. **FCA** innovation-driven valves find solutions to any customer challenge or toughest application.

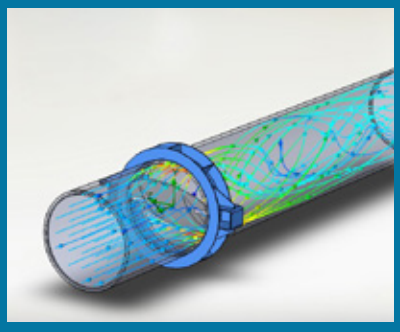
Our target-oriented dynamic team provides **FCA** with enough expertise to efficiently handle highly customized orders. Knowledge of how to manage our resources and capabilities ensures **FCA** to bring customers' expectations further.

Advanced software applications including Finite Element Analysis (FEA), computational fluid dynamics and three-dimensional solid modeling, and our proven know-how, help **FCA** designing high specification valves that meet the most demanding working requirements.

FCA aims partnering with major EPCs and End Users to develop innovative solutions for their valving needs. **FCA** specific capabilities include valve design; stress and finite element analysis; flow analysis; MAST and torque calculation; actuator sizing; testing and test data analysis; and validation of retrofit changes.

FCA offers a wide range of solutions for the toughest industry applications to meet each customer's requirements. This target is only achievable having a flexible multidisciplinary team focused on each customer's particular needs. **FCA** puts effort and makes sure that offers the most complete package assuring the highest quality.





WORLDWIDE

THERE WHERE OUR CUSTOMER IS

From a global vision of the sector and development dynamics of each country, **FCA** offers revolutionary supply alternatives to the customer, preserving the quality from its full design in Ibarra (Spain). Thanks to innovative applications, a professional team and its experience, **FCA** ensures quick response and results tailored to the needs of the customers anywhere in the world.

Its international service network is geared towards local attention in order provide flexible, close and customized solutions; getting so successful responses to new market needs and continuing to expand the activity at a geographical and sectorial level.

FCA valves are used in a wide range of applications such as Hydro Power plants and dams, mineral processing, Oil and Gas, Chemical and Petrochemical plants, Pulp and Paper, Steel industry, Thermal Power plants, Water treatment, Water distribution and Water pump stations as principal applications. Oriented according to main **OIL & GAS, MINERALS**, **POWER** and **WATER** sectors.

FCA OIL&GAS FCA MINERALS FCA POWER FCA WATER

QUALITY

Due to the applications where our products are installed, our standards are highly demanding. **FCA** valves are engineered to meet most industry's or key player's requirements, providing full code compliance solutions.

FCA comply with ISO 9001-2000 quality standard, guaranteed and certified by DNV. Additionally, international certifications are met such as CE for Pressure Equipment Directive (97/23/EC), Directive 2006/42/EC for machinery, ATEX Directive 94/9/EC, GOST TR/CU, etc...

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SPECIFICATIONS AND STANDARDS

Globe valves have an extended use in many industrial applications such as oil&gas, chemical and petrochemical plants, thermal applications, fertilizer plants, etc... They usually serve as on-off valves but can be used for flow regulation. For this main, FCA globe control valves such as TG or TGM models can be selected.

It's a metal seated design which could be suitable for a wide range of applications. The sealing is achieved due to the perfect tightness between the disc and the seat located in the valve's body.

LGS general service globe valve desing model ensures a perfect performance and sealing for pressure ratings up to ASME Class 900#. For high sizes and pressure ratings up to 2500# **LPS** Pressure seal bonneted desing model is available, performing a higher sealing force as internal pressure is increased. These straight pattern configurations provide large pressure drops across the valve.

LPY Y-Pattern model design forms a 45º angle at the stem disc joint in the flow direction and presents lower pressure drops to fluid flow than straightway design type valves. Angle Pattern design, for angles up to 90º can also be requested.

FCA Globe valves come with a variety of end connections: Flanged type, as standard, comes with Raised Face (RF) according to ASME Class 150#, 300# and 600#, and with Ring-Type-Joint flanges (RTJ) for Class ratings of 900# and 1500#. Buttwelded ends can also be supplied, with schedule according to customer specifications.

COVERING STANDARDS

FCA Globe Valves are mainly designed and manufactured according to standards such as BS-1873 "Specification for steel globe and globe stop and check valves (flanged and butt-welding ends) for the petroleum, petrochemical and allied industries", API 602 " Compact Steel Gate Valves - Flanged, Threaded, Welding, and Extended-Body Ends". The following standards are also considered: ASME BPVC "Boiler and Pressure Vesel Code", ASME B16.34 "Valves Flanged, Threaded and Welding Ends", ASME B16.10 "Face to Face dimensions of Flanged valves", ANSI B16.5 "Pipe Flanges and Flanged Fittings", ANSI B16.25 "Buttwelding Ends". API 598 "Valve Inspection and Testing" is applied for valve testing.

GENERAL FEATURES

HIGHLIGHTS

· Design and Manufacture according to BS1873, API602 and ASME B16.34.

· OS&Y Risign stem configuration, suitable for horizontal installation.

· Different body configurations; through way or Y-patter designs.

· Conical Metal seated.

· Hardfacing coating with Stellite, ENP or Tungsten carbide.

· Forged T-Stem design.

· Hadnwheel, gearbox, electric, pneumatic or hidraulic actuation.

· Wide range of body, bonnet and trim materials.

· Extended stem availability.

· Bi-directional flow.

· Bolted or Pressure seal bonnet configuration.

· Two piece contrustion gland for better alignment.

SECTORS

· Oil & Gas.
· Mineral Processing.
· Petrochemical plants.
· Thermal Power plants.
· Water distribution.
· Pump stations.
· etc...

APPLICATIONS

· Natural Gas pipelines.
· Oil pipelines.
· Refineries.
· Corrosive fluids.
· etc...

MANUFACTURING PROGRAM

TYPE	CLASS	2''	3''	4''	6''	8''	10''	12''	14''	16''	18''	20''	24''
General service Globe [LGS Mod.]	150#	●	●	●	●	●	●	●	●	●	●	●	●
	300#	●	●	●	●	●	●	●	●	●	●	●	●
	600#	●	●	●	●	●	●	●					
	900#		●	●	●	●	●						
Pressure seal design [LPS Mod.]	600#		●	●	●	●	●	●					
	900#		●	●	●	●	●						
	1500#		●	●	●	●	●						

GENERAL MATERIALS

BODY	WCB / WCC / A105 / LCB / LCC / LF2/ WC6 / CF8M / CF3M / F316 / F51 / F44
TRIM	WCB / WCC / A105 / LCB / LCC / LF2/ WC6 / CF8M / CF3M / F316 / F51 / F44
STEM	SS410 / SS316 / SS630
SEAT	CARBON STEEL + STL 6 / STAINLESS STEEL+STL 6
BONNET	WCB / WCC / A105 / LCB / LCC / LF2/ WC6 / CF8M / CF3M / F316 / F51 / F44
GASKETS	GRAPHITE / SS304+GRAPHITE / VITON
PACKING	GRAPHITE / PTFE
BACKSEAT	SS410 / SS316 / SS630
GLAND	WCB / CF8 / LCB
BUSHING	SS410 / SS316 / SS630
YOKE	WCB / CF8 / LCB
BOLTING	B7 / B7M / B8 / B8M / L7

Other materials and special applications available under request.

BODY AND BONNET

FCA designed various body-bonnet constructions such as bolted bonnet, pressure seal design or welded bonnet.

Bodies and bonnets are high quality with uniform section cast and then precisely machined, offering high performance and preventing stress concentrations.

The bodies provide a straight through port that ensures minimal turbulences, reduces erosion effect and minimizes resistance to flow. Guide slots accommodate the wedge during opening or closing operations of the valve for accurate alignment and guidance.

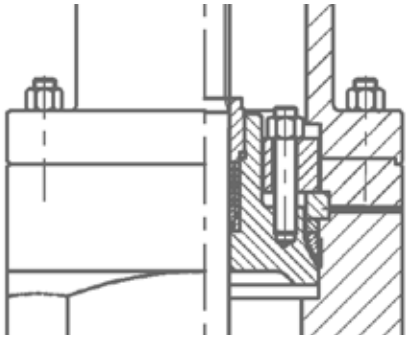
Depending on the size of the valve, bonnets are made either of one piece only, the yoke being and integral part of the bonnet, or have two pieces. This ensures accurate alignment of the stem and a smooth operation.

BODY AND BONNET JOINT

Body and bonnet joints of **FCA** valves are designed with a more than adequate number of bonnet bolts. The standard joint varies, depending on valve Class. For Class 150# gate valves consist of a square joint or oval design depending on size. According to valve service it can be supplied flat-face gasket with graphite or PTFE. Class 300# and 600# valves consist of a circular spiral wound gasket. For class 900# and above consist of a ring type joint.

RESSURE SEAL BONNET DESIGN

In pressure seal bonnet designs the sealing is achieved through a graphite gasket that takes advantage of the internal pressure of the line. This configuration reduces the weight of the valve sinze avoids large diameter body bonnet connection flange and large size body-bonnet bolting.



TRIM AND SEAT

Trim consists of a disc and a seat ring, it can also be directly seated against the body according to valve size. The disc is lowered onto a matching horizontal seat located in the center of the valve, where a tight contact can be assured and to stop flow through the system. Its design could be floated or convex bottom type. Ball discs can also be provided to fit into a tapered, flat-surface seat. The ball disk is best used in low pressure, low temperature systems. They can be used for throttling services but they are best used to on/off flow.

According to the application different materials can be selected in order to meet operating conditions at best.

BY-PASS VALVE

A By-pass valve can be furnished with the cast steel valves for equalizing pressure around the main valve or for warning up the line before opening the valve.

OS&Y CONSTRUCTION

Outside Screw and Yoke construction (OS&Y) is used as standard for **FCA** globe valves. The yoke is designed in order to easilly access valve stem.

STEM

All trims are provided with one piece forged and threaded stems. Are accurately machined and finally smoothed in order to minimize friction and reduce torque.

The wedge and stem union is reached by a T-shaped design that prevents stem disengaging itself from the trim. The design also allows the trim to self-align, eliminating the possibility of a bent stem jamming it. The conical raised surface design presses the seat against the bonnet backseat in the fully open position.

BACKSEAT

FCA globe valves are provided with backseat threaded in the bonnet, or directly welded to the bonnet for pressure seal designs. This allows to change the packing even when the valve is under pressure.

ANTI-CORROSIVE TREATMENTS

As standard, iron or carbon steel components are painted with an anti-corrosive treatment, providing the necessary protection against corrosion and an excellent surface finish.

Painting consists of:

· Epoxy primer with excellent corrosive protection and adhesion on every type of metal.

· BLUE RAL-5019 painting.

Depending on the valve application, FCA offers special treatments for specific abrasive and corrosive solutions like hardening, valve or component protective coating, etc... More information on request.

LIVE LOAD PACKING AND LEAK-OFF

In services that requires frequent cycling or high pressure and temperature variations, live loading extends the service life between maintenance periods by less frequent gland packing adjustments. Belleville springs can be provided to give a constant packing gland stress.

For critical services, a lantern rign with leak-off fittings connection and double packing stack can be provided to allow collection of leakage from the lower packing set.

MATERIAL SELECTION

For material selection fluid type characteristic, pressure and working temperature shall be considered. FCA carries many years of experience with special materials such as duplex, superduplex, hastelloy, inconel, nickel alloys, etc... Moreover standard forged or casted steels are daily work standard for our engineers. Other materials could be considered and provided on request according to customer specifications.

For internal parts such as the body seat and trim, corrosion and wear resistant materials are considered in addition to pressure drop values and temperature working range specifications. Stainless steel materials are provided as standard, considering Stellite contribution for seat components, and hardened stainless steels for higher corrosion resistance.

The following table presents frequently used materials for FCA globe valves, generally selected for severe service working applications:

MATERIAL	**CASTED** (ASTM)	**FORGED** (ASTM)
Carbon Steel	A216 Gr. WCB	A105
Stainless Steel	A351 Gr. CF8 / CF8M	A182 F316
Duplex Steel	A890 Gr. 4A	A182 F51
Superduplex Steel	A890 Gr. 5A / Gr. 6A	A182 F53 / F55
Inconel	-	Alloy 718

*Other materials on request.

ACTUATION DEVICES

All valves are available with different actuators. FCA has close cooperation with many world leader actuator manufactories and can offer a wide variety of interchangeable actuators:

· Bevel gear - handwheel.
· Electric motor.
· Pneumatic cylinder.
· Hydraulic cylinder.

Cv FLOW COEFFICIENT VALUES

Cv is known as flow coefficient value of a valve. This coefficient Cv is related to the flow and pressure conditions by the following basic liquid equation:

$$Cv=Q^*(SG/\Delta P)^{1/2}$$

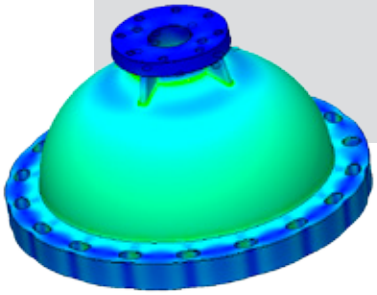
It is a relative measure of valves efficiency at allowing fluid flow. Q determines the flow rate (in gpm), SG refers to fluid specific gravity and Pressure drop is considered in psi. It describes the relationship between the pressure drop across the valve and the corresponding flow rate. In more practical terms, the flow coefficient Cv is the volume (in US gallons) of water at 60°F that will flow per minute through a valve with a pressure drop of 1 psi across the valve.

TYPE	CLASS	2''	3''	4''	6''	8''	10''	12''	14''	16''	18''	20''	24''
FCA Straight Pattern Globe Valves	150#	60	100	190	450	820	1300	1900	2450	3250	4300	5400	7800
	300#	60	100	190	450	820	1300	1900	2450	3180	4220	5300	7650
	600#	45	70	170	390	780	1200	1400	-	-	-	-	-
	900#	-	70	170	390	770	1120	-	-	-	-	-	-
	1500#	-	60	162	360	750	1080	-	-	-	-	-	-

CAE ENGINEERING TOOLS

Advanced software applications including Finite Element Analysis (FEA), computational fluid dynamics (CFD) and three-dimensional solid modeling, and our proven know-how, help FCA designing high specification valves to meet most demanded working requirements.

FCA LGS, LPS and LPY globe valves are engineered to meet high pressure working conditions, up to Class 2500#, considering the most cost effective design. For this aim, parametric studies with finite element analysis are performed by FCA engineering team.



GENERAL SERVICE GLOBE VALVES - LGS MODEL

Standard version available form DN50/2'' to DN600/24'' and pressure rating up to Class 900#. Other sizes and pressure on request.

ACCESORIES AND OPTIONS

· Design Standard according to BS1873 and ASME B16.34. Forged API 602 dimensions on request.

· Hardfacing coating with Stellite, ENP or Tungsten carbide.

· Handwheel, gearbox, electric, pneumatic or hidraulic actuation.

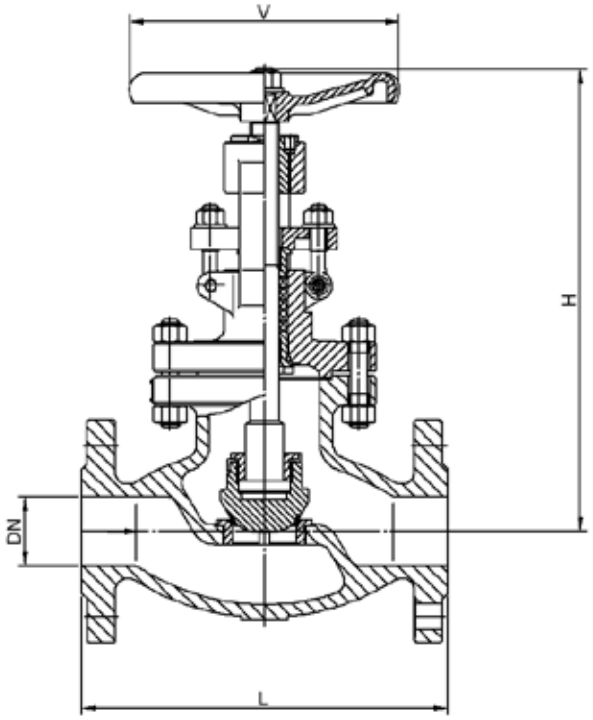
· Wide range of body, bonnet and trim materials.

· Extended stem availability.

· By-pass valves.

· Different end connections and flange drillings.

· Superior sizes and pressure.



DIMENSIONS - CLASS 150#

SIZE		L			H	V	Weight
NPS	DN	RF	RTJ	BW			
2''	50	203	216	203	340	200	25
3''	80	241	254	241	380	250	40
4''	100	292	305	292	450	250	65
6''	150	406	419	406	590	350	115
8''	200	495	508	495	650	450	185
10''	250	622	635	622	692	450	270
12''	300	698	711	698	810	610	375
14''	350	787	800	787	895	610	615
16''	400	914	927	914	980	720	885
18''	450	977	-	977	1070	720	1150
20''	500	977	-	977	1120	720	1650
24''	600	1295	-	1295	1310	850	2200

Notes: Dimensions in mm and estimated weight in Kg for RF design with manual actuator.
Bevel gear design from 16'' size.

DIMENSIONS - CLASS 300#

SIZE		L			H	V	Weight
NPS	DN	RF	RTJ	BW			
2''	50	267	283	267	370	200	35
3''	80	318	333	318	420	250	65
4''	100	356	371	356	500	350	100
6''	150	444	460	444	640	450	180
8''	200	559	575	559	710	450	290
10''	250	622	638	622	800	860	575
12''	300	711	727	711	910	860	770
14''	350	838	-	838	1075	860	880
16''	400	863	-	863	1370	610	1200
18''	450	977	-	977	1470	610	1600
20''	500	1016	-	1016	1565	720	2100
24''	600	1346	-	1346	1800	720	3150

DIMENSIONS - CLASS 600#

SIZE		L			H	V	Weight
NPS	DN	RF	RTJ	BW			
2''	50	292	295	292	460	250	54
3''	80	356	359	356	550	350	90
4''	100	432	435	432	670	450	145
6''	150	559	562	559	900	610	358
8''	200	660	664	660	1050	610	560
10''	250	787	791	787	1220	610	880
12''	300	838	841	838	1600	610	1300

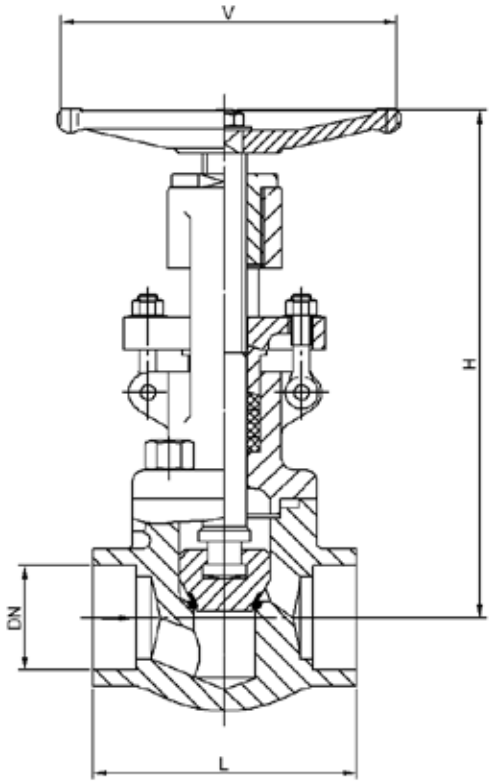
DIMENSIONS - CLASS 900#

SIZE		L			H	V	Weight
NPS	DN	RF	RTJ	BW			
3''	80	381	384	381	640	350	150
4''	100	457	460	457	780	500	250
6''	150	610	613	610	1040	500	400
8''	200	737	740	737	1340	610	800
10''	250	838	841	838	1630	610	1400

Notes: Dimensions in mm and estimated weight in Kg for RF design with manual actuator.
Bevel gear design from 10'' size.

PRESSURE SEAL BONNET DESIGN GLOBE VALVES - LPS MODEL

Standard version available form DN50/2'' to DN300/12'' and pressure rating up to Class 1500#. Other sizes and pressure on request.



ACCESORIES AND OPTIONS

· Y-Pattern LPY model dimensions on request.

· Design Standard according to BS1873 and ASME B16.34.

· Hardfacing coating with Stellite, ENP or Tungsten carbide.

· Handwheel, gearbox, electric, pneumatic or hidraulic actuation.

· Wide range of body, bonnet and trim materials.

· Extended stem availability.

· By-pass valves.

· Different end connections and flange drillings.

· Superior sizes and pressure.

DIMENSIONS - CLASS 600#

SIZE		L			H	V	Weight
NPS	DN	RF	RTJ	BW			
3''	80	356	359	356	510	350	80
4''	100	432	435	432	630	450	135
6''	150	559	562	559	880	610	280
8''	200	660	664	660	990	610	485
10''	250	787	791	787	1170	610	775
12''	300	838	841	838	1580	610	1180

DIMENSIONS - CLASS 900#

SIZE		L			H	V	Weight
NPS	DN	RF	RTJ	BW			
3''	80	381	384	381	640	350	110
4''	100	457	460	457	780	500	180
6''	150	610	613	610	1040	500	380
8''	200	737	740	737	1340	610	720
10''	250	838	841	838	1630	610	1300

DIMENSIONS - CLASS 1500#

SIZE		L			H	V	Weight BW
NPS	DN	RF	RTJ	BW			
3''	80	470	473	470	640	500	100
4''	100	546	549	546	780	610	160
6''	150	705	711	705	1040	610	400
8''	200	832	841	832	1340	880	640
10''	250	991	1000	991	1630	880	1200

Notes: Dimensions in mm and estimated weight in Kg for RF design with manual actuator.

Bevel gear design from 10'' size.

NOTES

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