Product group 55 catalogue no. 102

”Pressure Balanced Design”

TAPER TWIN PLUG VALVES

Double Block and Bleed Plug Valve

for derivatives, gases, chemicales and water.

View of BCH foundry, pattern and machine shop

Fully computerized design department

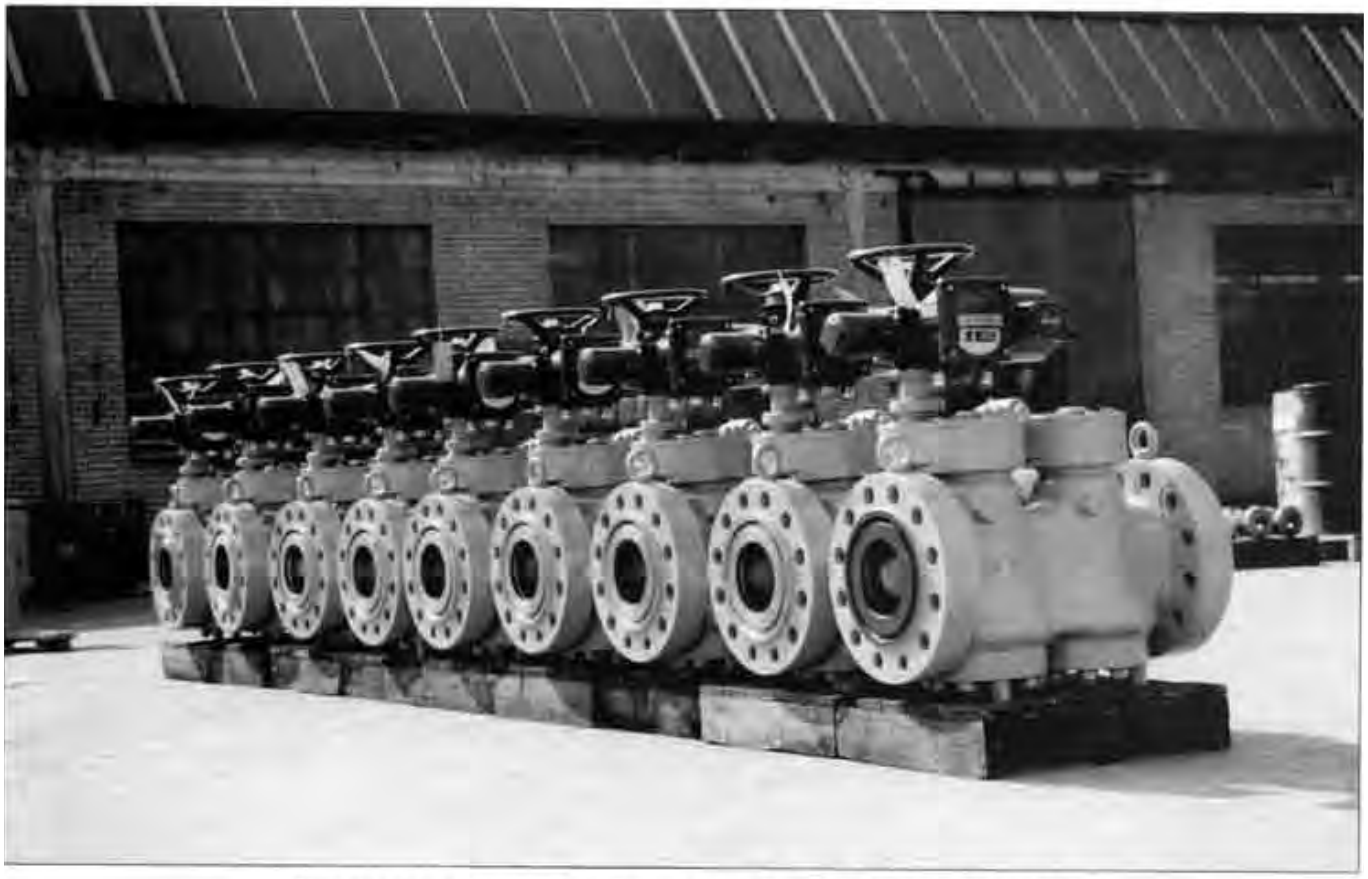
16" class 600 Twin plug pattern

10.000 kg of metal being poured

Large capacity vertical lathe

STRAIGHTWAY
TAPER TWIN PLUG VALVES

Brdr. Christensen Haner A/S Twin Plug Valves were first introduced into the market in 1995 in the North Sea. This design of valve has met with great success and many major Oil company troughout the world, have now standardized on the "Twin Plug" design. The complete "Twin Plug" design was developed by Brdr. Christensen Haner, which have a patent of the design.
The development of this valve follows over 40 years of experience at BCH producing high quality plug valves. All production is completed at our factory including pattern, casting, machining and all testing.



Christensen Twin Plug Valves fitted with electric actuators.

Cut-A-Way view

Brief Background and History of the Twin Plug Valve Development

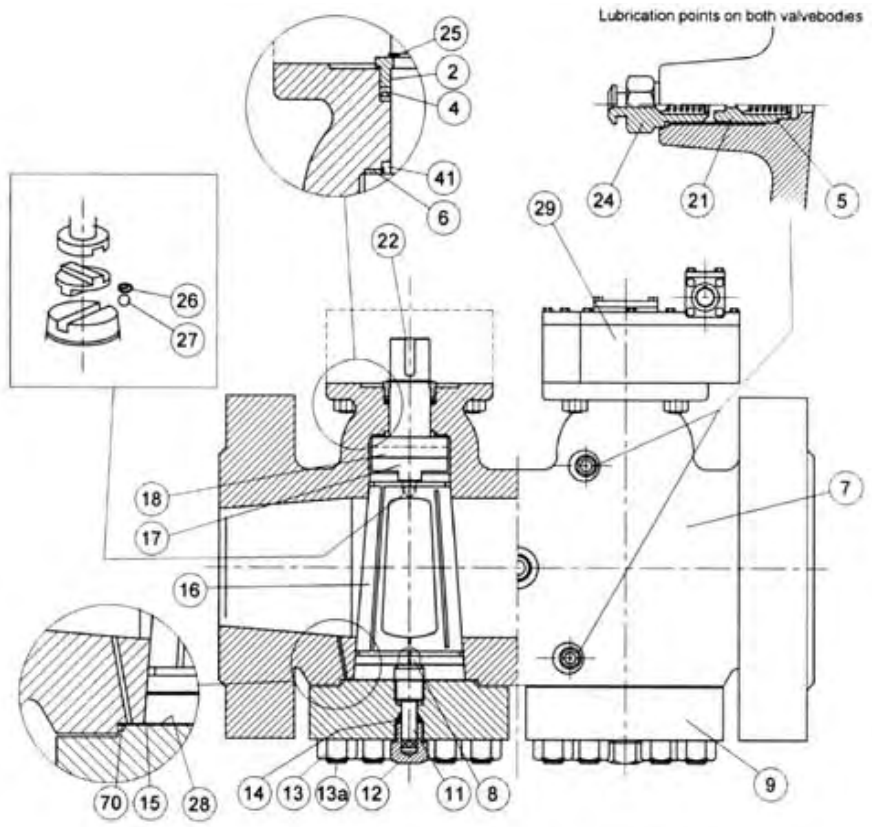
The Christensen Twin Plug Valve was first developed in 1993 as a direct result of several major oil companies expressing a need for a verifiable double isolation valve. Christensen valve was designed with the input of these major users. Brdr Christensen Haner was granted a patent for this design and we are proud to state we invented this new valve concept in plug valves. Working with these clients we produced several prototype valves at our foundry in Denmark. Complete NDT was performed on these valves to insure casting integrity and full conformance to the ASME and API codes. In 1994 our first prototype valves were installed at several high visibility offshore locations in the North Sea. Log books were kept by the client/end users and in several cases accelerated testing was performed to simulate extended service. After testing was completed usually 1-2 years of service (5-10 years simulated wear) these valves were removed from service and completely disassembled and inspected for damage, wear patterns etc.

In all cases our twin plug valves were in like new condition with no sign of wear or damage. These valves remain in service today. It should be noted that the twin plug valves were installed in what is best referred to as the most difficult troublesome applications. In most cases our valves were prototype tested in areas where single plugs or ball valves showed a pattern of repetitive failure.

To date our twin plugs have been installed at most major oil companies from Alaska to North Sea to Gulf of Mexico to South America. We have supplied these valves from 1" to 24". Classes from ASME 150 to 2500.

Typical Field Installations Sites for the Twin Plug

* WAG Services Isolation (H2O/miscible injectant)
* WAG Services Isolation (H2O/CO2)
* LACT Skids
* Test Manifold Diverter Valves
* MI Isolation
* Proving Loops
* Compressor Isolation
* Wherever Double Valving is used
* Wherever Single Block Valve and a Spectacle Blind is used
* Isolation to Level Control Valves
* Critical Vents, Drains, & Blowdowns to Atmosphere



Part No.:

2. Stembearing
4. Sealing Ring
5. Gasket
6. Thrust Plate
7. Body
8. Distance Piece
9. Bottom Cover
11. Pressure Screw
12. Bottom Screw
13. Nut
13a. Stud
14. Retaining Ring
15. Diaphragm
16. Plug
17. Equalizer Ring
18. Operating Stem
21. Check Valve
22. Parallel Key
24. Lubricant Screw
25. Snap Ring
26. Spring
27. Ball
28. Diaphragm
29. Gearbox
41. Fire Seal
70. Sealing Ring

The Christensen lubricated twin plug valve is designed for use in critical services where, verifiable tight shutoff is demanded. The design of the Twin Plug Valve is very compact with focus on space and weight savings. Furthermore, the design has far less possible leak paths compared to the conventional Double Block & Bleed Valve assemblies. In most sizes and pressure classes the face to face dimensions of this valve are the same as a single plug valve or ball valve.

The twin plug design is based on well known construction of the standard pressure balanced plug valve and is operated and maintained in the same way.

Since the only moving parts are the plug and the stem, the basic operation of the valve is very simple. When the plug is turned 90°, the valve moves from closed to open position - and vice versa.

The plug is tapered 1:6 and is individually fitted to the valve body with very close tolerances. It incorporates Metal to Metal sealing, which means that no soft seal will be damaged by the flowing medium.

As a secondary seal, the valve is provided with a lubrication system which allows feeding a special lubricant into the valve while the valve is in operation.

Besides, sealing, the purpose of the lubricant is to protect the internals of the valve against corrosion and wear as well as reducing the valve torque.

The valve is manufactured in the "Pressure Balanced Design", this means that the plug is provided with pressure balance holes which ensure that the plug is always in axial balance and consequently prevents the plug from taper locking. Furthermore, in order to reduce the valve torque, the surface of the plug is coated with P.T.F.E. film.

The plug and the operating stem are two separate parts which are connected by means of an equalizer ring acting as a universal joint. The stem is Blowout-proof. This means the only way to remove it is from the bottom after the valve is disassembled.

With three independent seals the stem sealing of the Christensen valve is unique. This is made up of a reinforced P.T.F.E. thrust plate (6) followed by a 100% pure graphite seal with a stainless steel back-up ring (41). The graphite seal is very efficient at extremely high temperatures and meets the most strict demands of several different standards relative to fire safe design. At the top of the stem, the primary seal (sealing ring) is placed (4). The sealing ring is P.T.F.E. (teflon) with a special alloy spring. The ring can be replaced from the outside. The sealing ring is kept in place by the stem bearing (2) and the snap ring/locking ring (25).

In addition to the stem seals mentioned, the wrench operated valve has a weatherproof seal to prevent penetration of water and dirt into the stem.

The bottom cover (9) is bolted on the valve body with the studs (13a) and the nuts (13). Two flexible plates of diaphragms (15) and (28) are placed in a recess between the valve body and the bottom cover. They function as a metal seal between the valve body and the bottom cover and also prevent the medium from leaking at the adjustment arrangement consisting of the pressure screw (11), the retaining ring (14) and the bottom screw (12).

A new feature has been added to protect against possible overpressure in the inner cavities (between, in and below the two plugs), this feature is a Patented Pressure Relief Bore. This feature is a bore going from the body sealing surface against the diaphragm, to the port outside of each plug. While operating normally, the bore is kept closed by the pressure of the bottom cover, obtained by studs and nuts, against the diaphragms.

If an overpressure occurs while both plugs are in the closed position, e.g. if the valve is exposed to thermal stress, the pressure against the bottom cover will cause the studs to stretch and then open the relief, so the pressure escapes into the pipeline. At no time does line pressure escape to atmosphere. At no time does the stretching of bottom studs exceed the allowable limits defined by the ASME/API codes. As the pressure falls the studs retract the bottom cover back into place and closes the bore.

Besides the metal to metal sealing between body and bottom cover a pure graphite sealing ring (70) is installed.

A bleed port is available in configuration as per customer preference. This port allows access to verify the sealing of the valve itself. Any leakage past the first plug would be detected via the bleed port.

The plug is adjusted within the valve body by means of a pressure screw (11) and is kept in place by the retaining ring (14) when the bottom screw (12) is tightened. All adjustments to the plug are accomplished by a "flexing" of the two diaphragm.

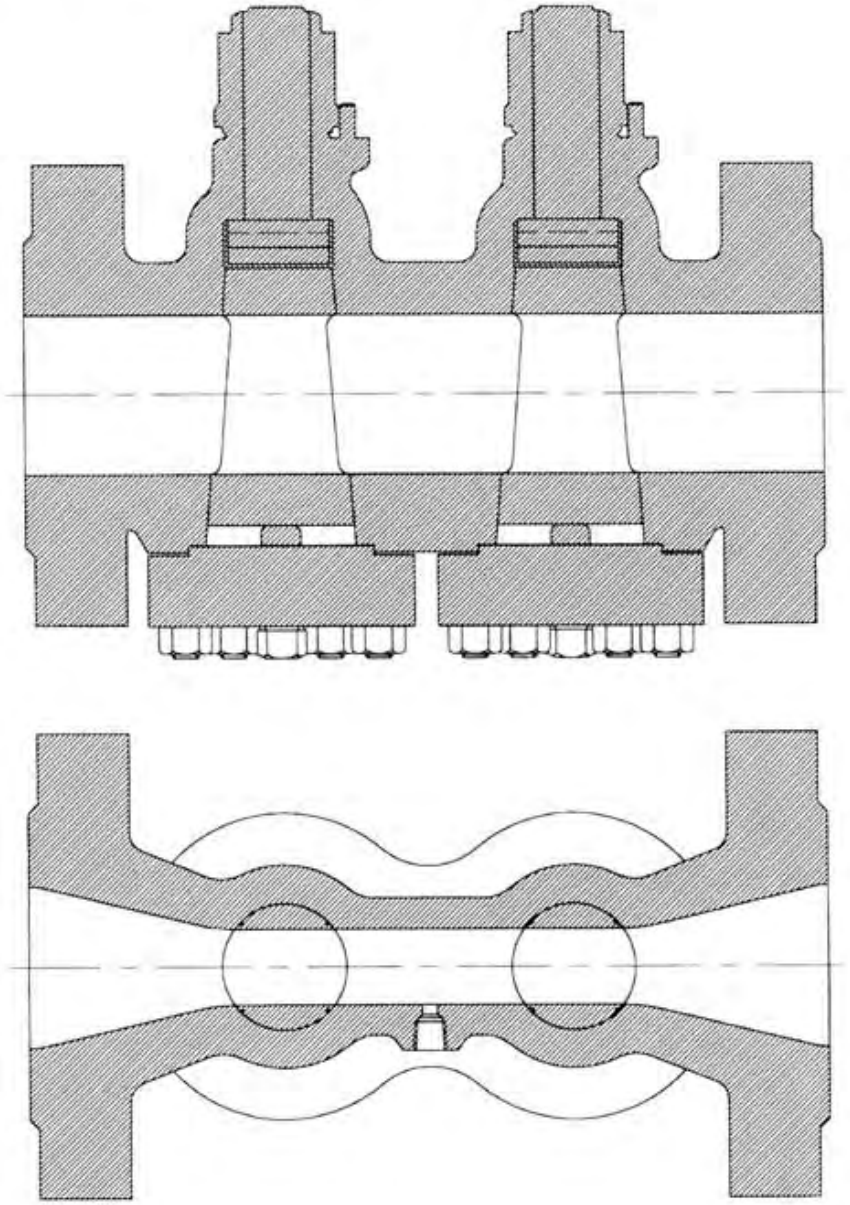
As mentioned, the valve is provided with a lubrication system which allows penetration of special lubricant into the valve through lubricant screws (24) and check valves (21). The lubricant is injected into a network of grooves by means of a special high pressure lubricant gun. This network system ensures that all seal faces are supplied with a thin coat of lubricant and by so doing becomes an efficient secondary seal.

The valves can be supplied as wrench operated or gear operated. On the gear operated valves the gear can be rotated 180° if needed.

Moreover, the Twin Plug valves are designed with ISO top as standard, which allow mounting of any kind of actuator. The Christensen Twin Plug is fully bidirectional and can be mounted in any position including upside down. Locking devices, sequential locking devices etc. are all available upon request.

Twin Plug Pattern

All Christensen Twin Plug Valves are designed to keep flow transitions to a minimum. The in line design results in maximum port areas with minimal flow profile changes. This results in Cv rates among the highest in the industry.



The design is such that there is only one recovery nozzle (outlet of 2nd plug). The flow rates of the Brdr. Christensen Twin Plug Valves are quite high and result in less pressure drop than witnessed with two separate single plug valves of equal size. The valve is bidirectional.

This catalogue covers Twin Plug Valves in the taper plug design to the ASME pressure class 150 - 300 - 400 - 600 - 900 - 1500 and 2500.

For information on valve types not covered by this catalogue, please contact our sole agent/ representative in your country.

To identify the correct type of valve, please use the figure number key on the following page, by means of which the valve figure number is specified in the shape of letters and digits.

When sending inquiries or orders to the supplier/representatives, it is important to state the exact details of the service (working conditions). Therefore, additional to the figure number, quantity and size, please state the following information:

Nature of service

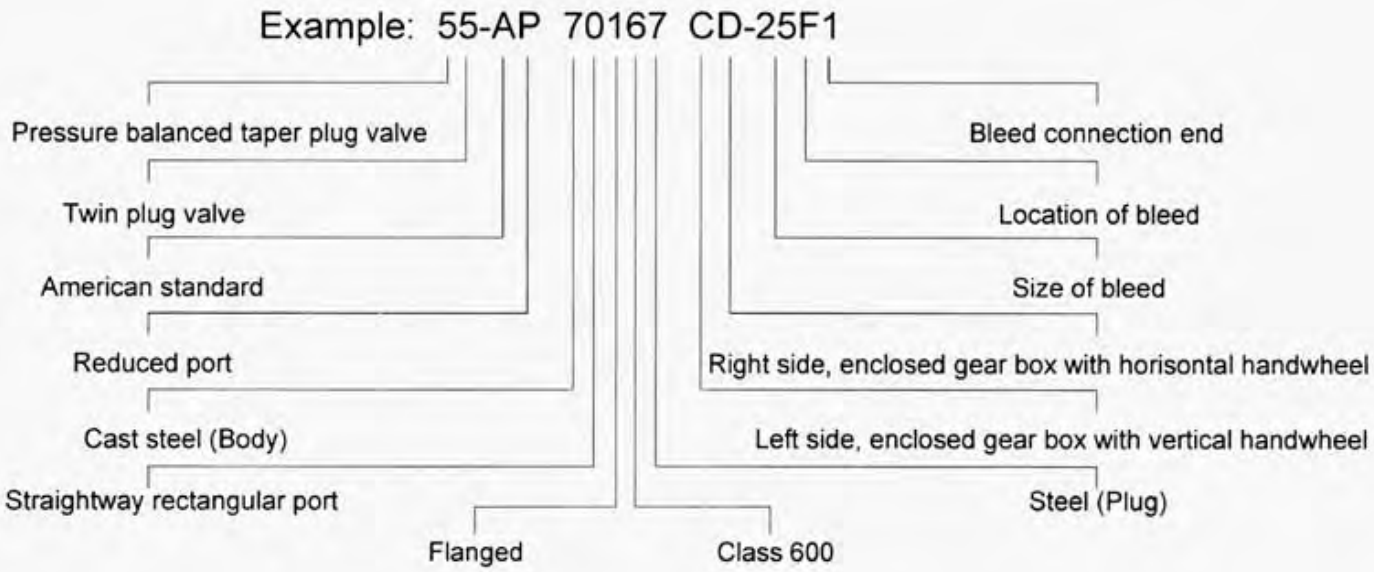
Range of temperature

Normal working pressure

Type of flanges (raised face/ring joint or other)

Dimension of pipe (only when valves have butt or socket welding ends)

Accessories, if any



Symbol:	1	2	3	4	5	6	7	8	9	10	11
Product group											
Twin Valve (tapered plug) "Pressure Balanced Design"	55										
Standard											
American API 6A		- AE									
American		- AP									
Materials in body											
Ductile Iron			2								
Cast Iron			4								
Cast Steel			7								
Stainless Steel			8								
Special Alloy Steel (To order)			9								
Port											
Straightway, rectangular				0							
Connection											
Screwed Ends					0						
Flanged Ends					1						
Clamps Ends					4						
Welding Ends					5						
Socket Welding Ends					6						
Pressure stage											
Class 125						1					
Class 150 (PN 20)						2					
Class 250						3					
Class 300 (PN 50)						4					
Class 400 (PN 64)						5					
Class 600 (PN 100) 2000 Psi						6					
Class 900 (PN 150) 3000 PSI						7					
Class 1500 (PN 250) 5000 PSI						8					
Class 2500 (PN 420) 10000 PSI						9					
Materials in plug											
Ductile Iron							2				
Cast Iron							4				
Steel							7				
Stainless Steel							8				
Special Alloy Steel (To order)							9				
Methods of operation											
Wrench on both valves								NN			
Wrench on left valve and gear with vertical handwheel on right valve								NC			
Wrench on right valve and gear with vertical handwheel on left valve								CN			
Wrench on left valve and bare stem and flange for actuator on right valve								NL			
Wrench on right valve and bare stem and flange for actuator on left valve								LN			
Gear with vertical handwheel on both valves								CC			
Gear with horizontal handwheel on both valves								DD			
Gear with vertical handwheel on left valve and gear with horizontal handwheel on right valve								CD			
Gear with vertical handwheel on right valve and gear with horizontal handwheel on left valve								DC			
Gear with vertical handwheel on left valve and bare stem and flange for actuator on right valve								CL			
Gear with vertical handwheel on right valve and bare stem and flange for actuator on left valve								LC			
Gear with horizontal handwheel on left valve and bare stem and flange for actuator on right valve								DL			
Gear with horizontal handwheel on right valve and bare stem and flange for actuator on left valve								LD			
Bare stem and flange for actuator on both valves								LL			
Size of bleed											
1/2"									- 15		
3/4"									- 20		
1"									- 25		
1 1/2"									- 40		
2"									- 50		
2 1/2"									- 65		
3"									- 80		
The customer specification.									- 90		
Location of bleed											
Frontside / Operatingside										F	
Backside/the opposite side of operatingside										B	
Bleed connection											
Screwed End											0
Flanged End											1
Integral- Block Flange incl. stud bolt											2
Clamps End											4
Welding End											5
Socket Welding End											6
Other ends (special end)											9

Example : 55-AP 70199 CL-25F1

CAST IRON
ASTM A 126 Class B (High strength grey iron).
Tensile Strength: min. 31000 PSI (214 N/mm²).
Cast Iron material is very economical and suitable for most common service conditions such as air, water, gas and oil at medium pressures and temperatures. It possesses good resistance to corrosion in most organic solutions, alkalies and many acids of higher concentrations at normal temperatures. Plugs are anti-friction treated with P.T.F.E.

DUCTILE IRON (Cast Iron with spheroidal Graphite).
ASTM A 536 Gr. 60-40-18.
Tensile Strength: min. 60000 PSI (414 N/mm²).
This material is especially used where cast iron does not fulfil the requirements and where cast steel is too expensive. Plugs are anti-friction treated with P.T.F.E.

CARBON STEEL
ASTM A 216 Grade WCB.
Tensile Strength: min. 70000 PSI (485 N/mm²).
PR valves of cast steel are made in accordance with the specification of the mentioned ASTM standard.
To counteract seizing steel plugs have a thin coat 20 µm of electroless nickel, and then anti-friction treated with P.T.F.E.
Carbon steel is suited for valves in cold or hot water services without corrosive impurities. It is also suitable for oil, gas, air and, other line fluids where valves are required of high strength, toughness and stability against vibration, blows and fire, except for extremely high or low temperatures which require steel alloys.
Our valves are also available to NACE Standard MR-01-75. Hardness level of Rc 22 or lower.

LEAD-BRONZE 80/10/10
CuPb10Sn10. ISO 1338 - ASTM B30 937.
Tensile Strength: min. 12500 PSI (180 N/mm²).
Brinell Hardness: 65
Chemical Properties: Resistant to actions of ordinary services.
Physical Properties: Good pressure tightness and resistant to wear.
Other alloys, fx. 90/10 or 88/10/2,0 are delivered on inquiry.

STAINLESS ACID-RESISTING STEEL
Rust and acid resisting

Chromium	Nickel	Molybdenum
Cr 18% to 21%	9 to 12%	2 to 3%

ASTM A 351 Grade CF8M or AISI 316.
Tensile Strength: min. 70000 PSI (485 N/mm²).
To counteract seizing plugs in stainless steel have a thin coat 20 µm electroless nickel, and then anti-friction treated with P.T.F.E.

AUSTENITIC - FERRITIC STEEL. (Duplex stainless steel)
ASTM A 890 4A,

Chromium	Nickel	Molybdenum	Nitrogen
Cr 22%	Ni 5%	Mo 2,5%	N 0.1%

Tensile strength: min. 620 N/mm².
The materials A 890 4A are austenitic-ferritic acid-resistant steel with very high mechanical properties. Moreover they are extremely, resistant to corrosion.
The materials A 890 4A are very resistant to stress - (SCC) and pitting corrosion in environments containing chloride. The resistance to stress corrosion (SCC) caused by hydrogen sulphide in environments containing chloride is also excellent.
The materials A 890 A4 meet the demands usually requiring high alloyed nickel qualities. As the content of cromonin and nickel is fairly low these materials will prove an economically good alternative to more expensive high alloyed qualities.
To counteract seizing plugs in stainless steel have a thin coat 20 µm electroless nickel, and then anti-friction treated with P.T.F.E

SPECIAL QUALITIES AND ALLOYS:
Tests which exceed the requirements of the respective standards can be carried out on the above mentioned materials if required.
Special alloys are manufactured on request.

COLOUR CODE
To facilitate identification BCH Valves are normally painted as follows:

Cast Iron	: Green	Steel	: Blue	Stainless Steel	: Silver Grey
Ductile	: Dark Grey	Bronze	: Unpainted	Duplex	: Light Grey

The Standards printed in bold print is to be considered as the main standard (specification). The below standards in thin print originate from the main standard. Each main standard has its own reference.
The list of standard practice is only intended as a guide.

List of Standard Practice	
BS 5353	**Specification for steel plug valves**
BS 1560	Circular Flange for Pipes, Valves and Fittings (Class designated)
BS 4504	Circular Flange for Pipes, Valves and Fittings (PN designated)
BS 21	Pipe Threads
BS 2080	Face-to-Face, Centre-to-Face, End-to-End and Centre-to-End dimensions of valves.
BS 6755	Testing of Valve Part 1 Specification for production pressure testing requirements.
ASME B 16.34	**Valves – Flanged, Threaded and Welding Ends**
ASME B 16.5	Pipe Flanges and Flanged Fittings
ASME B 16.11	Forged Fittings, Socket-Welding and Threaded Ends
ASME B 16.25	Buttwelding Ends
ASME B 1.20.1	Pipe Threads, General Purpose (Inch)
ASME B 16.10	Face-to-Face and End-to-End Dimensions of Valves
API 6D	**Specification for Pipeline Valves (Gate, Plug, Ball and Check Valves)**
ASME B 16.5	Pipe Flanges and Flanged Fittings
ASME B 31.4	Liquid Petroleum Transportation Piping Systems
ASME B 31.8	Gas Transmission and Distribution Piping Systems
API 599	**Metal Plug Valves – Flanged and Welding Ends**
API 598	Valve Inspection and Test.
ASME B 16.5	Pipe Flanges and Flanged Fittings.
ASME B 16.25	Buttwelding Ends
ASME B 16.10	Face-to-Face and End-to-End Dimensions of Valves.
ASME B 16.34	Valves – Flanged, Threaded and Welding Ends.
API 6A	**Specification for Wellhead and Christmas Tree Equipment.**
Quality management systems	**Design and manufacture of valves for liquid and gaseous applications on onshore and offshore installation in acc. to Pressure Equipment, Directive 97/23/EC** **Design and manufacture of valves and associated pipe fittings ISO 9001** **American Petroleum institute 6A** **American Petroleum institute 6D**
NACE MR0175	Standard Material Requirements Sulfide Stress Cracking Resistant – Metallic. Materials for Oilfield Equipment. The NACE MR01-75 standard can be connected to every main standard (printed with bold) provided that the choise of material is acceptable to the NACE MR01-75 standard
API 607	Fire Test for Soft-Seated Ball Valves.
API 6FA	Specification for Fire Test for Valves.
BS 6755	Testing of Valves Part 2 Specification for fire type-testing requirements.
ISO 10497	Testing of Valves – Fire Type – testing requirements. These Fire Test standards can be connected to every main standard.

API = American Petroleum Institute.
ASME = The American Society of Mechanical Engineers.
BS = British Standard
NACE = National Association of Corrosion Engineers.
ISO = The International Organization for Standardization

The simplest method of operating the valve is by using a wrench directly on top of the valve plug.

Straightway valves open and close by rotating through 90°.

The wrench can be fitted on the square of the valve plug in eight different positions. This is a big advantage in places with limited space.

The wrench is available in a short and a long version as type 8K and type 8L.

Wrench operation is used on relatively small valve sizes, as indicated on the dimension sheets.

Gear, type C, is enclosed in water-proof casing, with the handwheel located vertically on side of the valve. Worm and worm wheel are embedded in heavy bronze bearings, and the axial load stress is absorbed by ball bearings.
Both bearings and tooth racks are lubricated with concentrated molybdenum grease to resist high temperatures. (See lubrication of gear, page C4).

The gear has fixed stops at extreme position, plus position indicator.

Gear, type C, is available in all pressure classes and valve sizes, as indicated on the dimension sheets. Type C can be fitted with electric, pneumatic or hydraulic actuator.
The connection between valve and gear are a ISO type.

Gear, type D, is enclosed in water-proof casing, with the handwheel located horizontally on top of the valve.
Worm and worm wheel are embedded in heavy bronze bearings, and the axial load stress is absorbed by ball bearings.
Both bearings and tooth racks are lubricated with concentrated molybdenum grease to resist high temperatures. (See lubrication of gear, page C4).

The gear has fixed stops at extreme position, plus position indicator.

Gear, type D, is available in pressure classes and valve sizes, as indicated on the dimension sheets. Type D can be fitted with electric, pneumatic or hydraulic actuator.
The connection between valve and gear are a ISO type.

METHOD OF OPERATION

Christensen Twin Plug Valves are available in a number of possible modes of operation.

1) Both plugs wrench operated
2) One plug wrench, one plug gear operated
3) Both plugs gear operated
4) Pneumatic, Hydraulic or Electric Actuation on one or both plugs

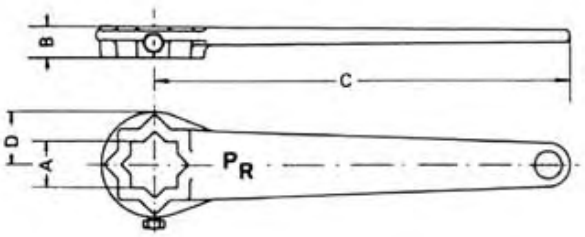
In addition to the above gearboxes are available in several configurations as well

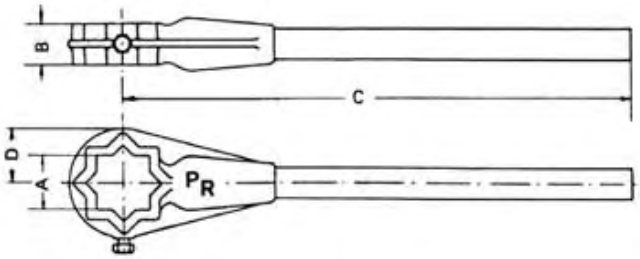
A) Vertical handwheel operation
B) Horizontal handwheel operation
C) Offset vertical handwheel operation
D) Offset Horizontal Handwheel operation
E) Handwheel operation from either side of valve or from the same side of valve

This variety of configurations insures that our design usually fits into the tightest of available spaces.

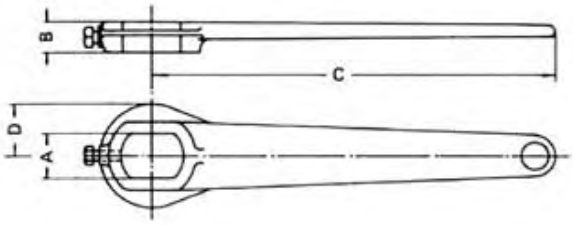
Customer must advise which above configuration is preferred. Standard configuration is two vertical handwheels when gearboxes are required.

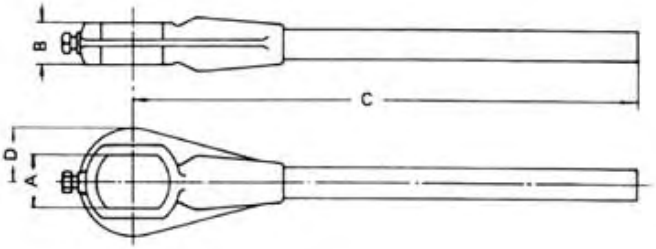
Standard wrench type 8K (Short)





Standard wrench type 2K (Short)

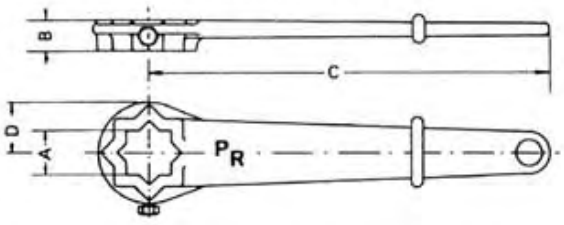


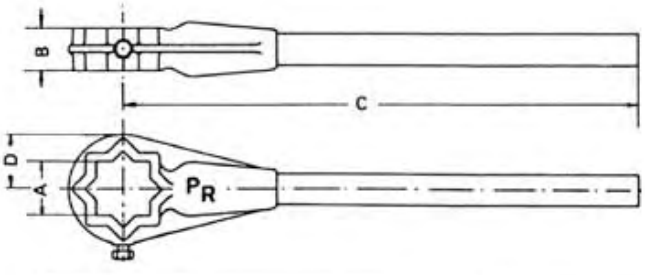


A	B	C	D
17	14	140	20
19	16	150	22
24	18	200	26
27	20	225	30
30	22	280	33
36	26	330	38
50	40	420	52

A	B	C	D
55	45	815	58
65	50	940	70
70	50	1090	76

Wrench type 8L (Long)



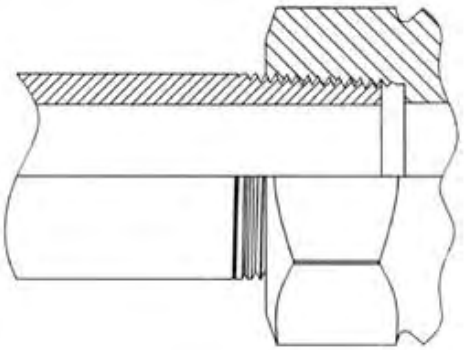


A	B	C	D
17	14	230	20
22	20	300	30
24	20	300	30
27	20	340	30
30	26	420	38
36	26	470	42

A	B	C	D
41	35	650	50
50	45	815	58
55	50	1090	70
65	50	1270	80

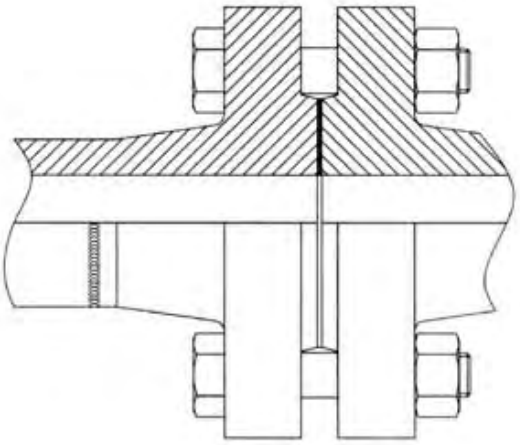
Screwed Ends:

Designed in accordance with API Line Pipe threads (Taper) API Std. 5B Table 2.1 or ASME Std. B1.20.1. Available in size 1/2" to 4".



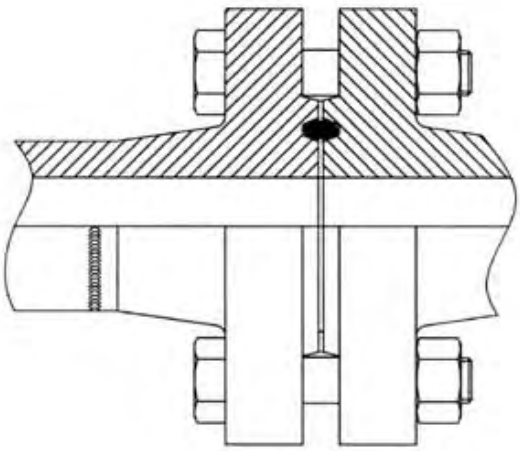
Flanges RF:

Designed in accordance with the ASME B16.5 Standard, except that two or four of the bolt holes at the lower part of the flange are threaded. See the dimensions page B1.



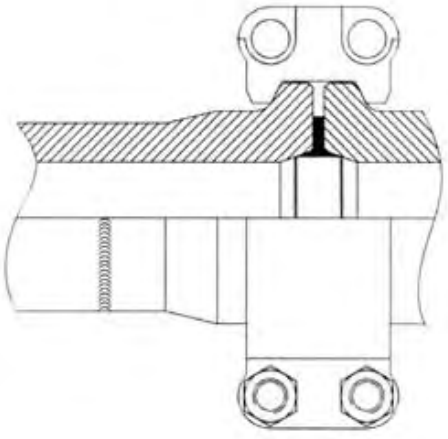
Flanges RJ:

Designed in accordance with the ASME B16.5 Standard, except that two or four of the bolt holes at the lower part of the flange are threaded. See the dimensions page B1.



Clamps:

Designed in accordance with the customer specified clamps type (For instance grayloc, spo lock, destec, techlok etc.).



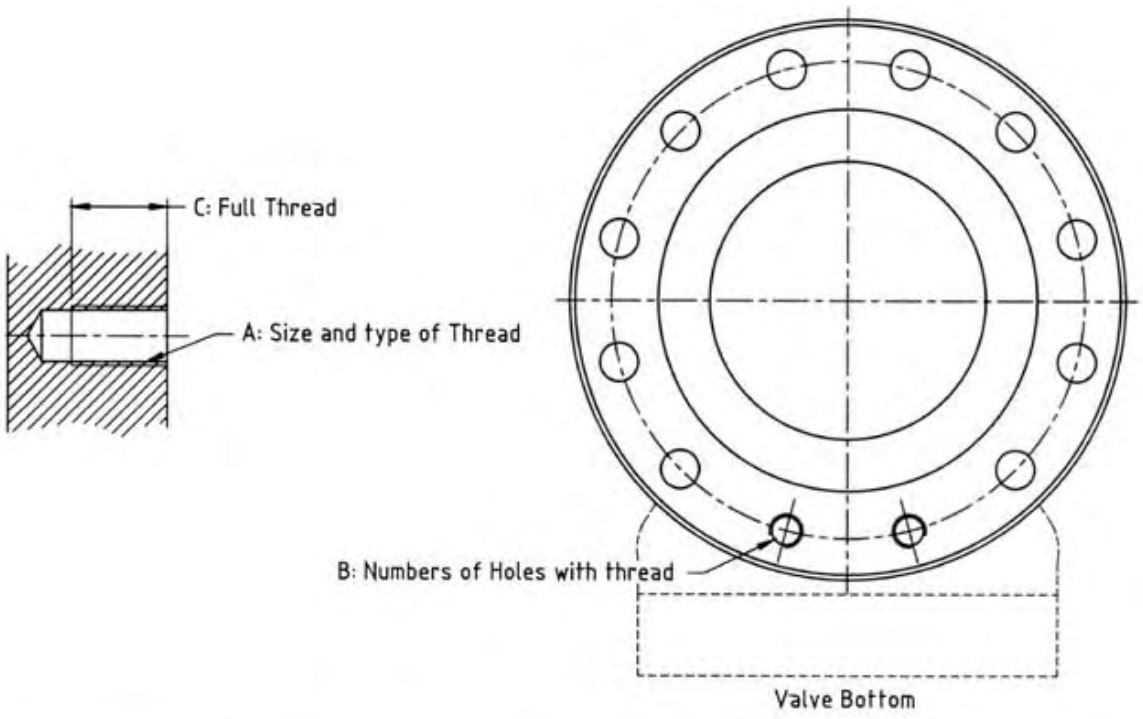
		Code
Standard operation:	Smaller valves have square heads for Wrench operation on both valves.	NN
	Large valve have gear operation with Vertical handwheel on both valves. The front of the valve is the operatingside	CC

Standard size of bleed connection:

				Code
Valve:	DN 1"	Bleed:	1/2"	15
Valve:	DN 2"	Bleed:	1/2"	15
Valve:	DN 3"	Bleed:	1/2"	15
Valve:	DN 4"	Bleed:	3/4"	20
Valve:	DN 6"	Bleed:	3/4"	20
Valve:	DN 8"	Bleed:	1"	25
Valve:	DN 10"	Bleed:	1"	25
Valve:	DN 12"	Bleed:	1"	25
Valve:	DN 14"	Bleed:	1 1/2"	40
Valve:	DN 16"	Bleed:	1 1/2"	40
Valve:	DN 18"	Bleed:	2"	50
Valve:	DN 20"	Bleed:	2"	50
Valve:	DN 24"	Bleed:	2"	50

Standard location of bleed:	On the valve backside = the opposite of operatingside Valves ≤ DN 4" have always lubrication point on the opposite side of the bleed	B
Standard bleed connection:	Screwed (inside thread API) Valve size ≤ 12"	0
	Flanged RF Valve size ≥ 14"	1

NB. When requirement are different from the BCH standard, please advise at inquiry or order stage.



In each connection flange									
Valve Size	Class 150			Class 300			Class 600		
DN	A	B	C	A	B	C	A	B	C
1"	1/2" UNC	2	15 mm	5/8" UNC	2	19 mm	5/8" UNC	2	19 mm
2"	5/8" UNC	2	19 mm	5/8" UNC	2	19 mm	5/8" UNC	2	19 mm
3"				3/4" UNC	2	22 mm	3/4" UNC	2	22 mm
4"	No threaded holes			No threaded holes			7/8" UNC	2	25 mm
6"	3/4" UNC	2	22 mm	3/4" UNC	2	22 mm	1" UNC	4	30 mm
8"	3/4" UNC	2	22 mm	7/8" UNC	2	25 mm	1 1/8" 8UN	4	30 mm
10"	7/8" UNC	2	25 mm	1" UNC	4	30 mm	1 1/4" 8UN	4	38 mm
12"							1 1/4" 8UN	4	38 mm
14"							1 3/8" 8UN	4	42 mm
16"							1 1/2" 8UN	4	46 mm
18"							1 5/8" 8UN	4	49 mm
20"							1 5/8" 8UN	4	49 mm
24"							1 7/8" 8UN	6	56 mm

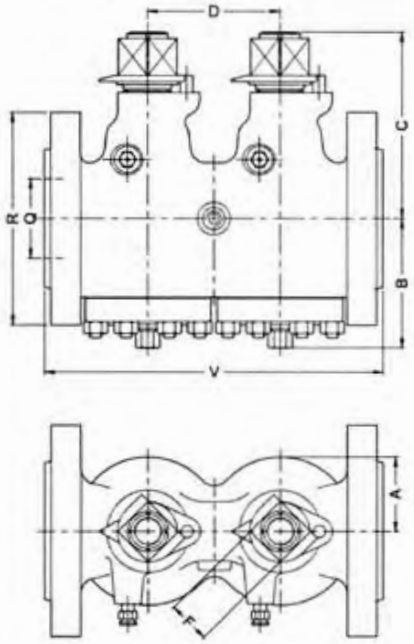
In each connection flange									
Valve Size	Class 900			Class 1500			Class 2500		
DN	A	B	C	A	B	C	A	B	C
1"	7/8" UNC	4	25 mm	7/8" UNC	4	25 mm			
2"	7/8" UNC	2	25 mm	7/8" UNC	2	25 mm	1" UNC	2	33 mm
3"	7/8" UNC	2	25 mm	1 1/8" 8UN	2	30 mm	1 1/4" 8UN	2	38 mm
4"	1 1/8" 8UN	2	30 mm	1 1/4" 8UN	2	38 mm	1 1/2" 8UN	2	46 mm
6"	1 1/8" 8UN	2	30 mm	1 3/8" 8UN	4	42 mm	2" 8UN	2	61 mm
8"	1 3/8" 8UN	2	42 mm	1 5/8" 8UN	2	49 mm	2" 8UN	4	61 mm
10"	1 3/8" 8UN	4	42 mm	1 7/8" 8UN	2	57 mm	2 1/2" 8UN	4	76 mm
12"	1 3/8" 8UN	4	42 mm	2" 8UN	4	61 mm			
14"	1 1/2" 8UN	4	46 mm	2 1/4" 8UN	2	68 mm			
16"	1 5/8" 8UN	4	49 mm	2 1/2" 8UN	4	76 mm			

STRAIGHTWAY
TAPER TWIN PLUG VALVES

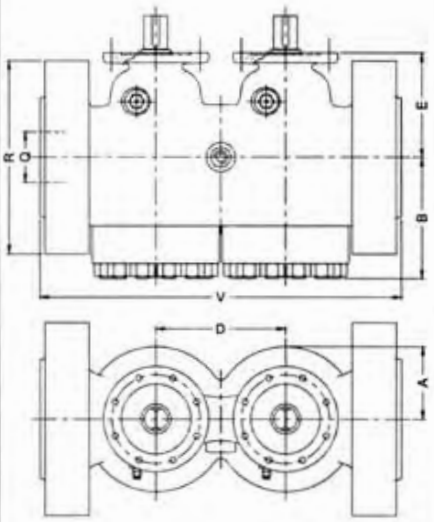
CAST STEEL CLASS 150
RECTANGULAR PORT

Class	Max. CWP	Test Pressure	Pattern	Connections	Port	Materials	
						Body & Cover	Plug
150	285 Psi	Shell 450 Psi Seat 315 Psi	Straight-way	Flanges R.F. or R.J. ASME B 16.5 Face to Face See column V Bleed: See Data sheet or specified by purchaser	Rectan-gular	Cast Steel ASTM A 216 Grade WCB Cover: EN 10025 S355 J0 S355 J2G3	Cast Iron ASTM A 126 Class B / Steel

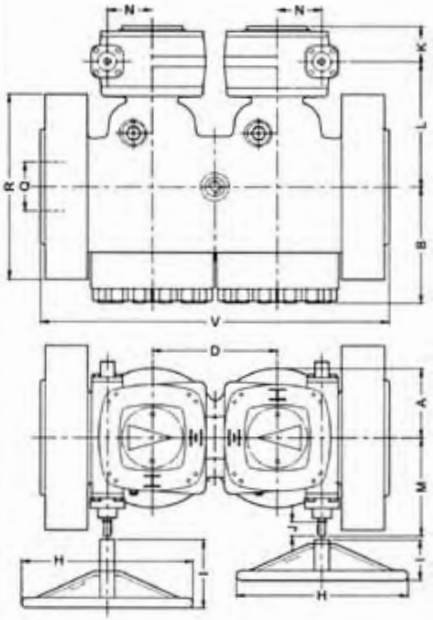
Operation: Manual by wrench.
Type 8K.



Operation: Bare stem with mounting flange for actuation "ISO 5211"



Operation: Manual worm gear with vertical handwheel.



Plug	DN 1" – 6"	DN 1" – 20"	DN 1" – 4"
Cast Iron	55-AP 70124 NN-XXXX	55-AP 70124 LL-XXXX	55-AP 70124 CC-XXXX
Steel	55-AP 70127 NN-XXXX	55-AP 70127 LL-XXXX	55-AP 70127 CC-XXXX

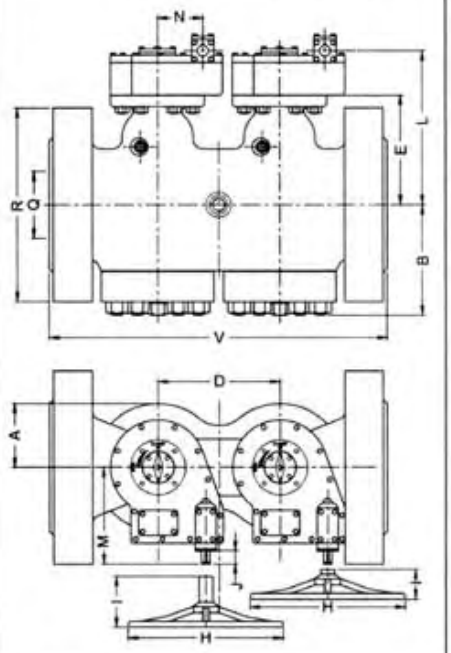
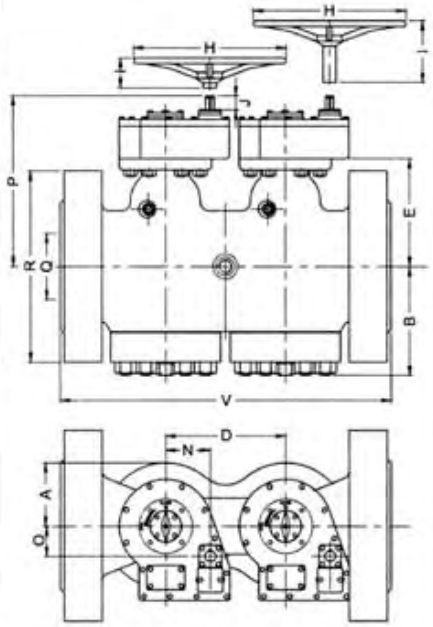
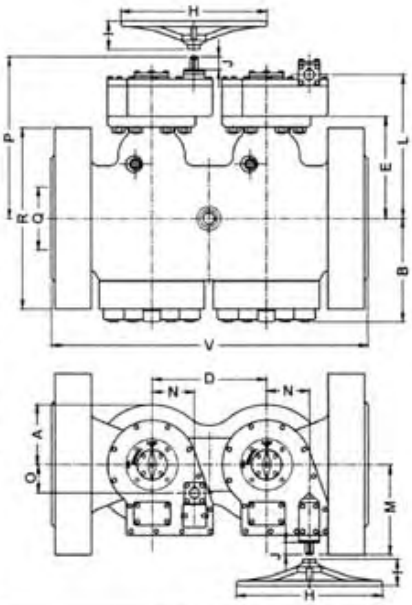
XXXX : See data sheet page A12 or code sheet page A5

DN	A	B	C	D	E	F	H	I	J	K	L	M	N	Q	R	Raised Face V	Ring Joint V	ISO Flange 5211
1"	52	88	138	100	89	30	300	124/174	31,5	38	122	132	40	25	124	229	229	F07
2"	65	102	158	115	110	30	300	124/174	31,5	38	143	132	40	51	152	267	279	F07
3"	80	115	190	145	131	36	300	124/174	31.5	38	164	132	40	76	191	343	355	F07
4"	86	155	224	170	177	50	300	124/174	31.5	40	218	132	50	102	229	432	445	F10
6"	116	180	282	232	215	55								152	279	546	558	F12
8"	147	229		270	255									203	343	622	635	F14
10"	150	244		296	280									254	406	661	674	F16
12"	175	274		340	311									305	483	762	774	F16
14"	190	333		372	347									337	533	889	902	F16
16"	193	347		428	372									387	597	991	1004	F25
18"	258	395		516	450									438	635	1092	1104	F25
20"	275	420		530	471									489	699	1194	1209	F25

STRAIGHTWAY
TAPER TWIN PLUG VALVES

CAST STEEL CLASS 150
RECTANGULAR PORT

Class	Max. CWP	Test Pressure	Pattern	Connections	Port	Materials	
						Body & Cover	Plug
150	285 Psi	Shell 450 Psi Seat 315 Psi	Straight-way	Flanges R.F. or R.J. ASME B 16.5 Face to Face See column V Bleed: See Data sheet or specified by purchaser	Rectan-gular	Cast Steel ASTM A 216 Grade WCB Cover: EN 10025 S355 J0 S355 J2G3	Cast Iron ASTM A 126 Class B / Steel

Operation: Manual worm gear with vertical handwheel CC	Operation: Manual worm gear with horizontal handwheel DD	Operation: Manual worm gear with one horizontal handwheel and one vertical hand-wheel DC
		

Plug	DN 6" – 20"	DN 6" – 20"	DN 6" – 20"
Cast Iron	55-AP 70124 CC-XXXX	55-AP 70124 DD-XXXX	55-AP 70124 DC-XXXX
Steel	55-AP 70127 CC-XXXX	55-AP 70127 DD-XXXX	55-AP 70127 DC-XXXX

XXXX : See data sheet page A12 or code sheet page A5

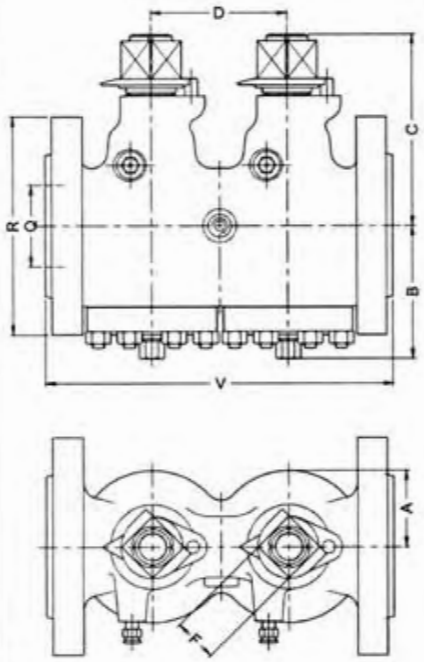
DN	A	B	D	H	I	J	L	M	N	O	P	Q	R	Raised Face V	Ring Joint V
6"	116	180	232	400	101/201	38	314	205	85	46	374	152	279	546	558
8"	147	229	270	400	101/201	38	350	205	85	46	409	203	343	622	635
10"	150	244	296	400	101/201	38	378	205	85	46	438	254	406	661	674
12"	175	274	340	600	101/201	38	418	230	95	70	479	305	483	762	774
14"	190	333	372	600	101/201	38	499	298	135	69	570	337	533	889	902
16"	193	347	428	600	101/201	38	525	298	135	69	596	387	597	991	1004
18"	258	395	516	600	101/201	38	601	337	160	108	672	438	635	1092	1104
20"	275	420	530	600	101/201	38	622	337	160	108	693	489	699	1194	1209

STRAIGHTWAY
TAPER TWIN PLUG VALVES

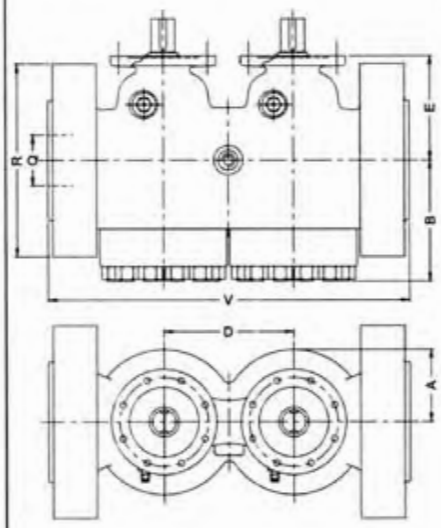
CAST STEEL CLASS 300
RECTANGULAR PORT

Class	Max. CWP	Test Pressure	Pattern	Connections	Port	Materials	
						Body & Cover	Plug
300	740 Psi	Shell 1125 Psi Seat 815 Psi	Straight-way	Flanges R.F. or R.J. ASME B 16.5 Face to Face See column V Bleed: See Data sheet or specified by purchaser	Rectan-gular	Cast Steel ASTM A 216 Grade WCB Cover: EN 10025 S355 J0 S355 J2G3	Cast Iron ASTM A 126 Class B Steel

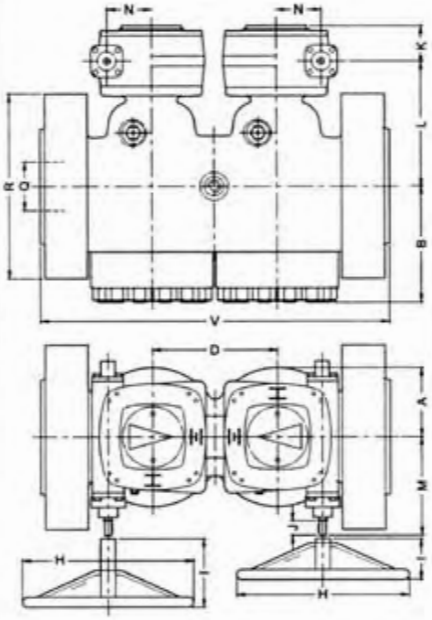
Operation: Manual by wrench. Type 8K



Operation: Bare stem with mounting flange for actuation "ISO 5211"



Operation: Manual worm gear with vertical handwheel.



Plug	DN 1" – 6"	DN 1" – 20"	DN 1" – 4"
Cast Iron	55-AP 70144 NN-XXXX	55-AP 70144 LL-XXXX	55-AP 70144 CC-XXXX
Steel	55-AP 70147 NN-XXXX	55-AP 70147 LL-XXXX	55-AP 70147 CC-XXXX

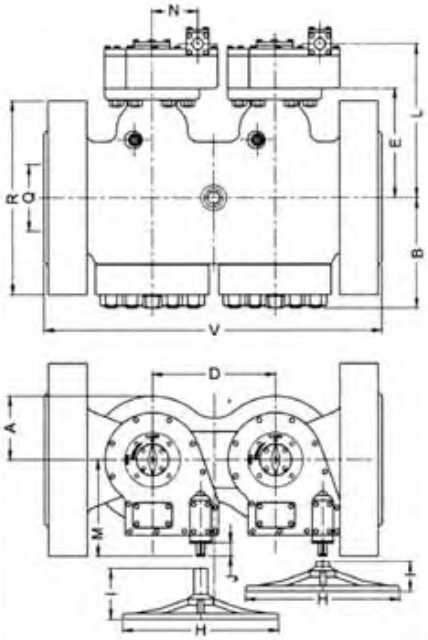
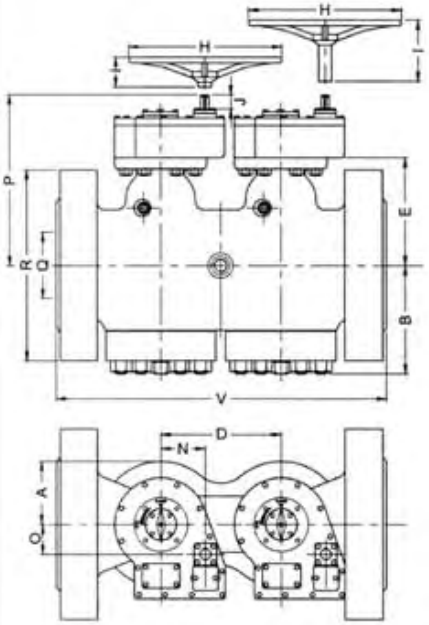
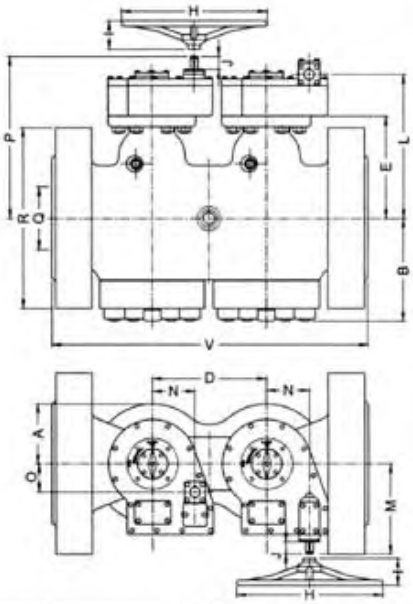
XXXX : See data sheet page A12 or code sheet page A5

DN	A	B	C	D	E	F	H	I	J	K	L	M	N	Q	R	Raised Face V	Ring Joint V	ISO Flange 5211
1"	52	88	138	100	89	30	300	124/174	31,5	38	122	132	40	25	124	229	229	F07
2"	65	102	158	115	110	30	300	124/174	31,5	38	143	132	40	51	165	283	299	F07
3"	80	115	190	165	131	36	300	124/174	31.5	40	172	132	50	76	210	387	403	F10
4"	86	155	224	170	177	50	300	124/174	42	49	220	165	63	102	254	457	473	F10
6"	116	215	282	232	219	55								152	318	559	575	F14
8"	147	229		270	255									203	381	686	702	F14
10"	186	296		360	314									254	445	826	842	F16
12"	175	274		340	311									305	521	864	880	F16
14"	190	333		372	347									337	584	889	905	F25
16"	198	363		420	372									387	648	991	1006	F25
18"	258	395		516	450									432	711	1092	1108	F30
20"	275	420		530	471									483	775	1194	1213	F30

STRAIGHTWAY
TAPER TWIN PLUG VALVES

CAST STEEL CLASS 300
RECTANGULAR PORT

Class	Max. CWP	Test Pressure	Pattern	Connections	Port	Materials	
						Body & Cover	Plug
300	740 Psi	Shell 1125 Psi Seat 815 Psi	Straight-Way	Flanges R.F. or R.J. ASME B 16.5 Face to Face See column V Bleed: See Data sheet or Specified by purchaser	Rectan-gular	Cast Steel ASTM A 216 Grade WCB Cover: EN 10025 S355 J0 S355 J2G3	Cast Iron ASTM A 126 Class B / Steel

Operation: Manual worm gear with vertical handwheel CC	Operation: Manual worm gear with horizontal handwheel DD	Operation: Manual worm gear with one horizontal handwheel and one vertical hand-wheel DC
		

Plug	DN 6" – 20"	DN 6" – 20"	DN 6" – 20"
Cast Iron	55-AP 70144 CC-XXXX	55-AP 70144 DD-XXXX	55-AP 70144 DC-XXXX
Steel	55-AP 70147 CC-XXXX	55-AP 70147 DD-XXXX	55-AP 70147 DC-XXXX

XXXX : See data sheet page A12 or code sheet page A5

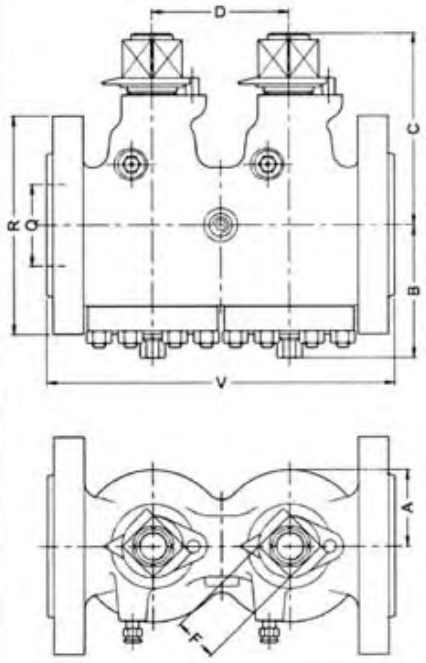
DN	A	B	D	H	I	J	L	M	N	O	P	Q	R	Raised Face V	Ring Joint V
6"	116	215	232	400	101/201	38	314	205	85	46	374	152	318	559	575
8"	147	229	270	400	101/201	38	350	205	85	46	409	203	381	686	702
10"	186	296	360	600	101/201	38	421	230	95	70	482	254	445	826	842
12"	175	274	340	600	101/201	38	418	230	95	70	479	305	521	864	881
14"	190	333	372	600	101/201	38	499	298	135	69	570	337	584	889	905
16"	198	363	420	600	101/201	38	525	298	135	69	596	387	648	991	1006
18"	258	395	516	600	101/201	38	601	337	160	108	672	432	711	1092	1108
20"	275	420	530	600	101/201	38	622	337	160	108	693	483	775	1194	1213

STRAIGHTWAY
TAPER TWIN PLUG VALVES

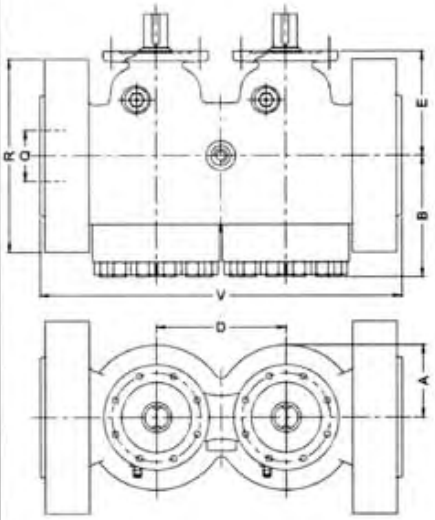
CAST STEEL CLASS 400
RECTANGULAR PORT

Class	Max. CWP	Test Pressure	Pattern	Connections	Port	Materials	
						Body & Cover	Plug
400	990 Psi	Shell 1500 Psi Seat 1090 Psi	Straight-way	Flanges R.F. or R.J. ASME B 16.5 Face to Face acc. to ASME B 16.10 Regular and Venturi Pattern Class 600 Bleed: See Data sheet or specified by purchaser	Rectan-gular	Cast Steel ASTM A 216 Grade WCB Cover: EN 10025 S355 J0 S355 J2G3	Cast Iron ASTM A 126 Class B / Steel

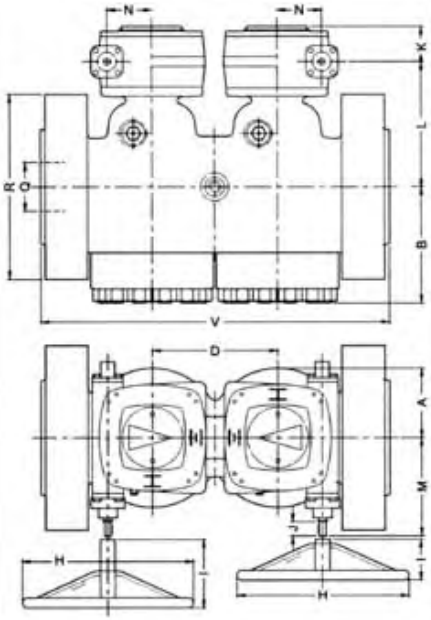
Operation: Manual by wrench.
Type 8L



Operation: Bare stem with mounting flange for actuation "ISO 5211"



Operation: Manual worm gear with vertical handwheel.



Plug	DN 1" – 4"	DN 1" – 24"	DN 1" – 4"
Cast Iron	55-AP 70154 NN-XXXX	55-AP 70154 LL-XXXX	55-AP 70154 CC-XXXX
Steel	55-AP 70157 NN-XXXX	55-AP 70157 LL-XXXX	55-AP 70157 CC-XXXX

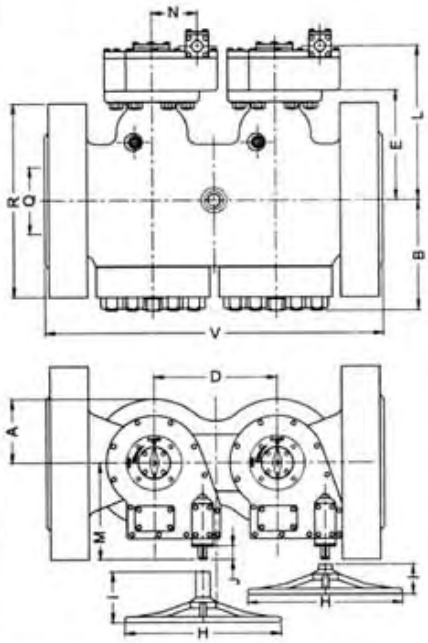
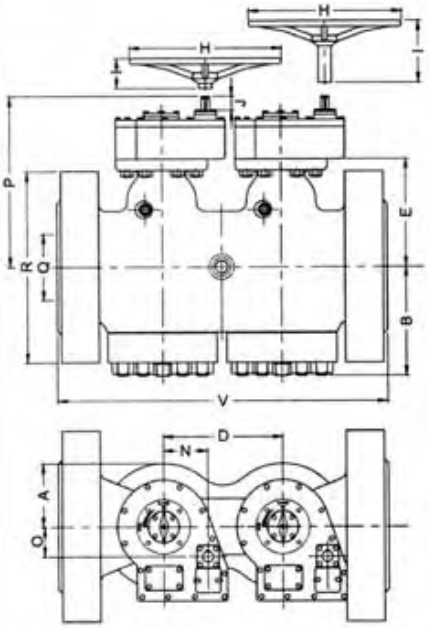
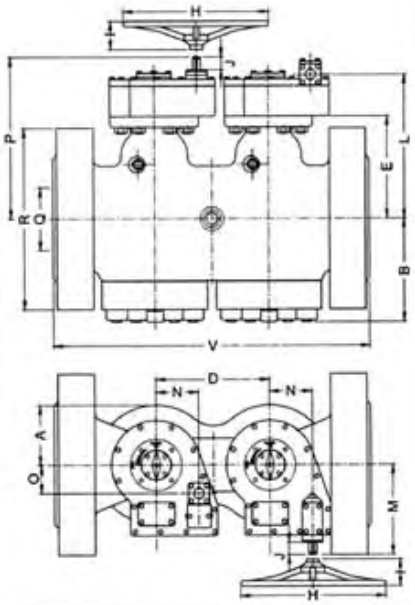
XXXX : See data sheet page A12 or code sheet page A5

DN	A	B	C	D	E	F	H	I	J	K	L	M	N	Q	R	Raised Face V	Ring Joint V	ISO Flange 5211
1"	52	88	138	100	89	30	300	124/174	31,5	38	122	132	40	25	124	229	229	F07
2"	65	109	158	115	110	30	300	124/174	32	38	143	132	40	51	165	292	295	F07
3"	76	134	198	137	139	36	300	124/174	40	40	182	132	50	76	210	356	359	F10
4"	95	159	242	170	169	55	300	124/174	42	49	215	165	63	102	254	432	435	F12
6"	123	210		232	219									152	318	559	562	F14
8"	152	250		264	260									203	381	660	664	F16
10"	172	290		320	281									254	445	787	791	F25
12"	184	322		343	359									305	521	838	841	F25
14"	202	326		380	350									334	584	889	892	F30
16"	230	370		415	385									381	648	991	994	F30
18"	257	431		450	470									432	711	1092	1095	F35
20"	284	478		494	504									481	775	1194	1200	F35
24"	332	550		600	580									575	914	1397	1407	F40

STRAIGHTWAY
TAPER TWIN PLUG VALVES

CAST STEEL CLASS 400
RECTANGULAR PORT

Class	Max. CWP	Test Pressure	Pattern	Connections	Port	Materials	
						Body & Cover	Plug
400	990 Psi	Shell 1500 Psi Seat 1090 Psi	Straight-way	Flanges R.F. or R.J. ASME B 16.5 Face to Face acc. to ASME B 16.10 Regular and Venturi Pattern class 600 Bleed: See Data sheet or specified by purchaser	Rectan-gular	Cast Steel ASTM A 216 Grade WCB Cover: EN 10025 S355 J0 S355 J2G3	Cast Iron ASTM A 126 Class B / Steel

Operation: Manual worm gear with vertical handwheel CC	Operation: Manual worm gear with horizontal handwheel DD	Operation: Manual worm gear with one horizontal handwheel and one vertical hand-wheel DC
		

Plug	DN 6" – 24"	DN 6" – 24"	DN 6" – 24"
Cast Iron	55-AP 70154 CC-XXXX	55-AP 70154 DD-XXXX	55-AP 70154 DC-XXXX
Steel	55-AP 70157 CC-XXXX	55-AP 70157 DD-XXXX	55-AP 70157 DC-XXXX

XXXX : See data sheet page A12 or code sheet page A5

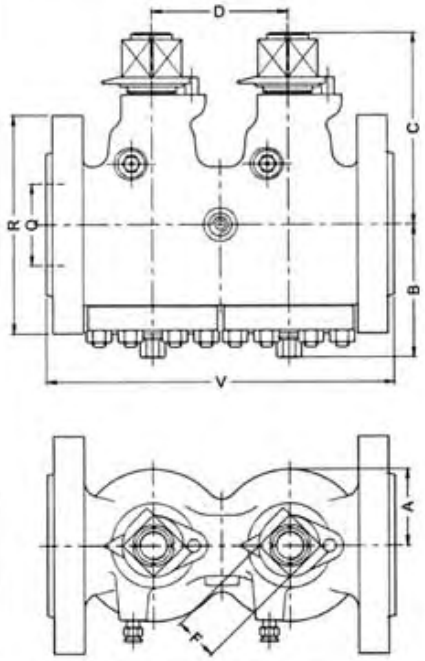
														Raised Face	Ring Joint
DN	A	B	D	H	I	J	L	M	N	O	P	Q	R	V	V
6"	123	210	232	400	101/201	38	316	205	85	46	376	152	318	559	562
8"	152	250	264	400	101/201	38	358	205	85	46	418	203	381	660	664
10"	172	290	320	400	101/201	38	447	230	95	70	453	254	445	787	791
12"	184	322	343	600	101/201	38	495	298	135	69	557	305	521	838	841
14"	202	326	380	600	101/201	38	505	298	135	69	577	334	584	889	892
16"	230	370	415	600	101/201	38	542	337	160	108	613	381	648	991	994
18"	257	431	450	700	101/201	38	625	360	175	130	696	432	711	1092	1095
20"	284	478	494	700	101/201	38	659	360	175	130	730	481	775	1194	1200
24"	332	550	600	700	101/201	38	735	438	200	210	809	575	914	1397	1407

STRAIGHTWAY
TAPER TWIN PLUG VALVES

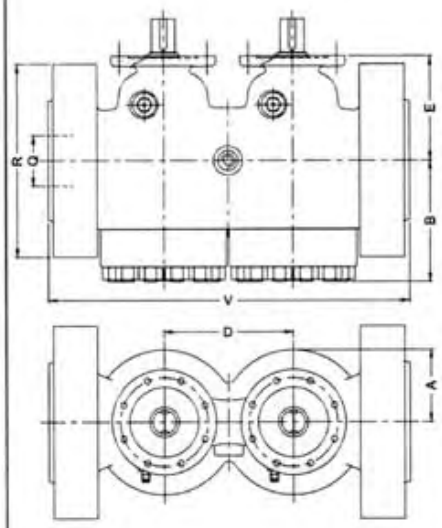
CAST STEEL CLASS 600
RECTANGULAR PORT

Class	Max. CWP	Test Pressure	Pattern	Connections	Port	Materials	
						Body & Cover	Plug
600	1480 Psi	Shell 2225 Psi Seat 1630 Psi	Straight-way	Flanges R.F. or R.J. ASME B 16.5 Face to Face acc. to ASME B 16.10 Regular and Venturi Pattern Bleed: See Data sheet or specified by purchaser	Rectan-gular	Cast Steel ASTM A 216 Grade WCB Cover: EN 10025 S355 J0 S355 J2G3	Cast Iron ASTM A 126 Class B Steel

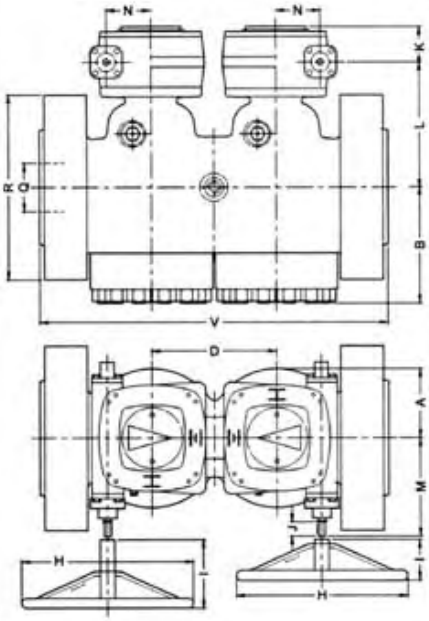
Operation: Manual by wrench. Type 8L



Operation: Bare stem with mounting flange for actuation "ISO 5211"



Operation: Manual worm gear with vertical handwheel.



Plug	DN 1" – 4"	DN 1" – 24"	DN 1" – 4"
Cast Iron	55-AP 70164 NN-XXXX	55-AP 70164 LL-XXXX	55-AP 70164 CC-XXXX
Steel	55-AP 70167 NN-XXXX	55-AP 70167 LL-XXXX	55-AP 70167 CC-XXXX

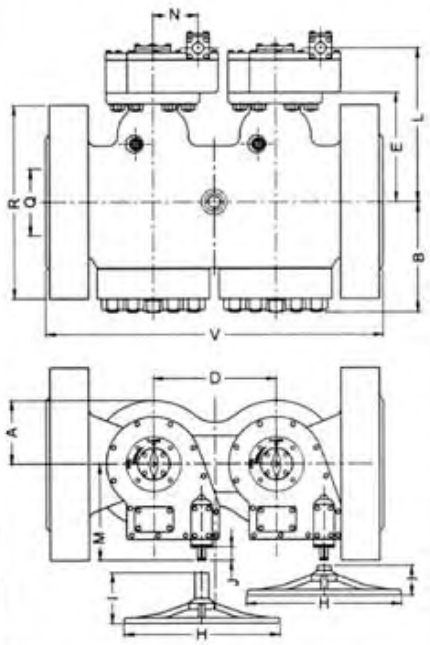
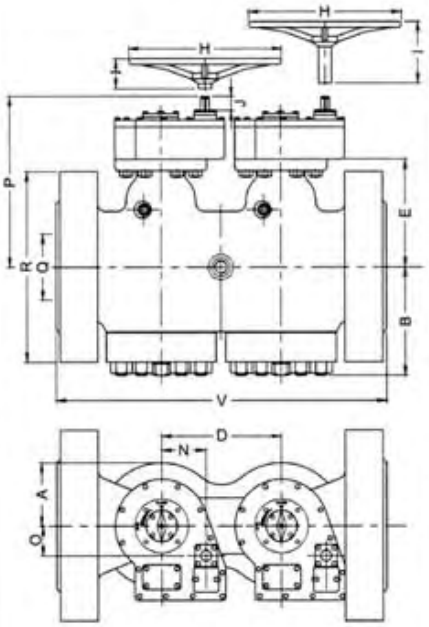
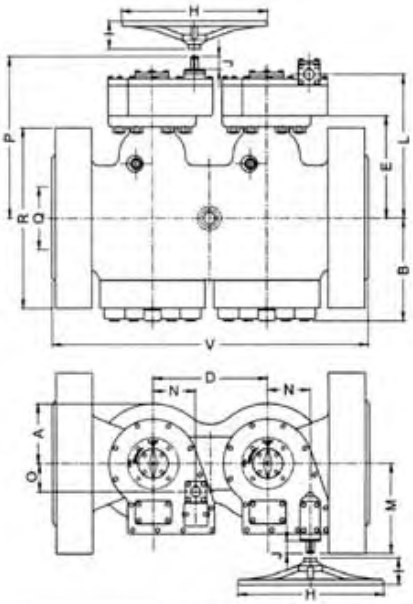
XXXX : See data sheet page A12 or code sheet page A5

DN	A	B	C	D	E	F	H	I	J	K	L	M	N	Q	R	Raised Face V	Ring Joint V	ISO Flange 5211
1"	52	88	138	100	89	30	300	124/174	31,5	38	122	132	40	25	124	229	229	F07
2"	65	109	158	115	110	30	300	124/174	32	38	143	132	40	51	165	292	295	F07
3"	76	134	198	137	139	36	300	124/174	40	40	182	132	50	76	210	356	359	F10
4"	95	159	242	170	169	55	300	124/174	42	49	215	165	63	102	273	432	435	F12
6"	123	210		232	219									152	356	559	562	F14
8"	152	250		264	260									200	419	660	664	F16
10"	172	290		320	281									248	508	787	791	F25
12"	184	322		343	359									299	559	838	841	F25
14"	202	326		380	363									327	603	889	892	F30
16"	230	370		415	385									375	686	991	994	F30
18"	257	431		450	487									419	743	1092	1095	F35
20"	284	478		494	504									464	813	1194	1200	F35
24"	332	550		600	580									559	940	1397	1407	F40

STRAIGHTWAY
TAPER TWIN PLUG VALVES

CAST STEEL CLASS 600
RECTANGULAR PORT

Class	Max. CWP	Test Pressure	Pattern	Connections	Port	Materials	
						Body & Cover	Plug
600	1480 Psi	Shell 2225 Psi Seat 1630 Psi	Straight-way	Flanges R.F. or R.J. ASME B 16.5 Face to Face acc. to ASME B 16.10 Regular and Venturi Pattern Bleed: See Data sheet or specified by purchaser	Rectan-gular	Cast Steel ASTM A 216 Grade WCB Cover: EN 10025 S355 J0 S355 J2G3	Cast Iron ASTM A 126 Class B / Steel

Operation: Manual worm gear with vertical handwheel CC	Operation: Manual worm gear with horizontal handwheel DD	Operation: Manual worm gear with one horizontal handwheel and one vertical hand-wheel DC
		

Plug	DN 6" – 24"	DN 6" – 24"	DN 6" – 24"
Cast Iron	55-AP 70164 CC-XXXX	55-AP 70164 DD-XXXX	55-AP 70164 DC-XXXX
Steel	55-AP 70167 CC-XXXX	55-AP 70167 DD-XXXX	55-AP 70167 DC-XXXX

XXXX : See data sheet page A12 or code sheet page A5

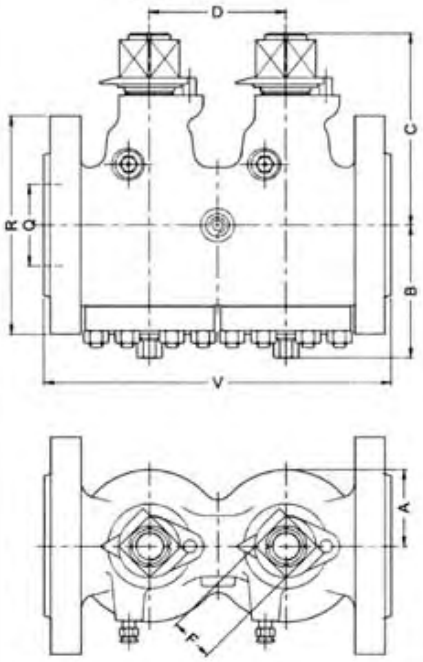
														Raised Face	Ring Joint
DN	A	B	D	H	I	J	L	M	N	O	P	Q	R	V	V
6"	123	210	232	400	101/201	38	316	205	85	46	376	152	356	559	562
8"	152	250	264	400	101/201	38	358	205	85	46	418	200	419	660	664
10"	172	290	320	500	101/201	38	392	230	95	70	453	248	508	787	791
12"	184	322	343	600	101/201	38	486	298	135	69	557	299	559	838	841
14"	202	326	380	600	101/201	38	506	298	135	69	577	327	603	889	892
16"	230	370	415	600	101/201	38	542	337	160	108	613	375	686	991	994
18"	257	431	450	700	101/201	38	625	360	175	130	696	419	743	1092	1095
20"	284	478	494	700	101/201	38	659	360	175	130	730	464	813	1194	1200
24"	332	550	600	700	101/201	38	738	438	200	210	809	559	940	1397	1407

STRAIGHTWAY
TAPER TWIN PLUG VALVES

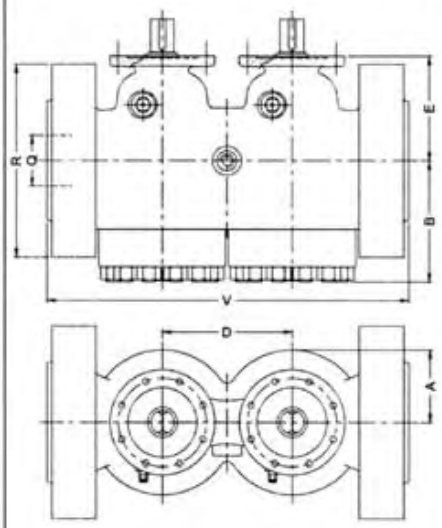
CAST STEEL CLASS 900
RECTANGULAR PORT

Class	Max. CWP	Test Pressure	Pattern	Connections	Port	Materials	
						Body & Cover	Plug
900	2220 Psi	Shell 3350 Psi Seat 2442 Psi	Straight-way	Flanges R.F. or R.J. ASME B 16.5 Face to Face acc. to ASME B 16.10 Regular and Venturi Pattern Bleed: See Data sheet or Specified by purchaser	Rectan-gular	Cast Steel ASTM A 216 Grade WCB Cover: EN 10025 S355 J0 S355 J2G3	Cast Iron ASTM A 126 Class B / Steel

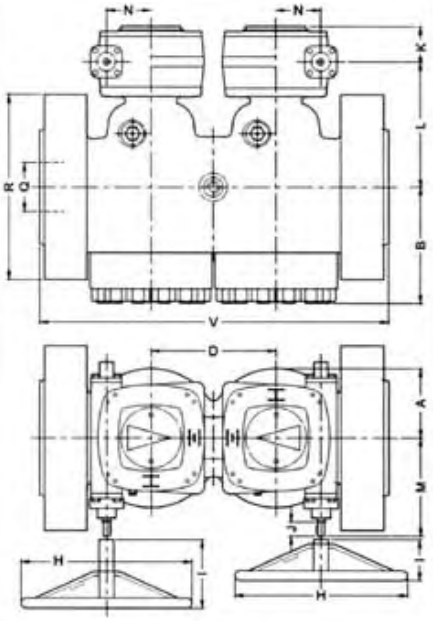
Operation: Manual by wrench. Type 8L



Operation: Bare stem with mounting flange for actuation "ISO 5211"



Operation: Manual worm gear with vertical handwheel.



Plug	DN 1" – 3"	DN 1" – 18"	DN 1" – 4"
Cast Iron	55-AP 70174 NN-XXXX	55-AP 70174 LL-XXXX	55-AP 70174 CC-XXXX
Steel	55-AP 70177 NN-XXXX	55-AP 70177 LL-XXXX	55-AP 70177 CC-XXXX

XXXX : See data sheet page A12 or code sheet page A5

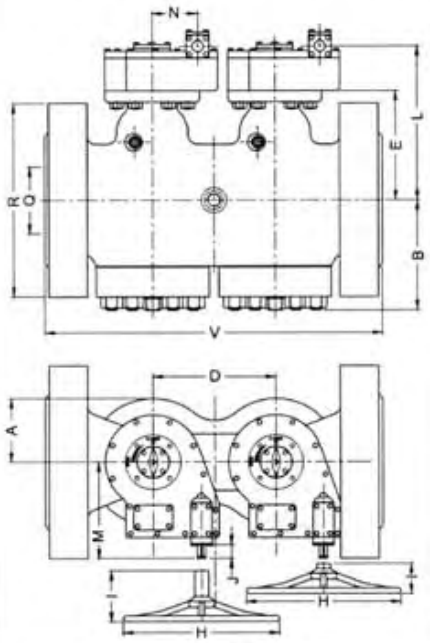
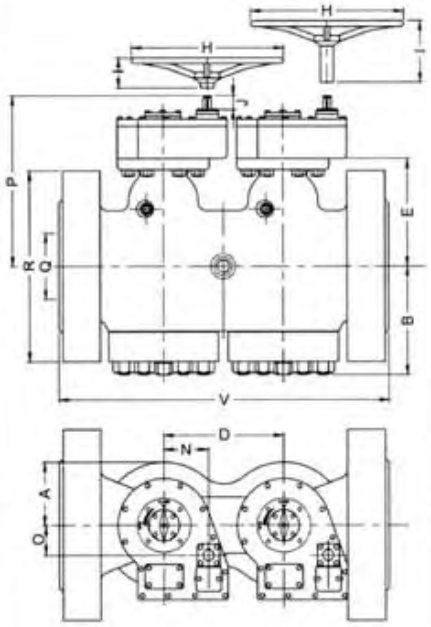
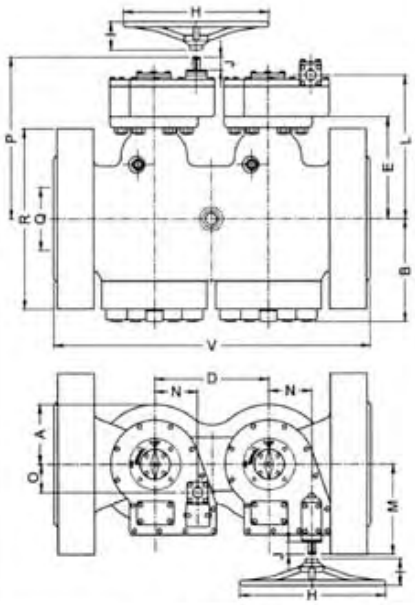
DN	A	B	C	D	E	F	H	I	J	K	L	M	N	Q	R	Raised Face V	Ring Joint V	ISO Flange 5211
1"	56	93	139	90	89	30								22	150	254	254	F07
2"	76	125	175	145	124	30	300	124/174	32	40	165	132	50	48	216	368	372	F10
3"	82	134	204	145	137	41	300	124/174	32	40	178	132	50	73	241	381	384	F10
4"	96	163	245	175	170	50	300	124/174	42	49	216	165	63	98	292	457	460	F12
6"	127	216		245	219									146	381	610	613	F14
8"	158	252		305	276									191	470	737	740	F16
10"	184	297		340	306									238	546	838	841	F25
12"	208	334		400	350									283	610	965	968	F30
14"	235	379		416	403									311	641	*1029	*1038	F30
16"	260	450		464	434									356	705	1130	1140	F35
18"	312	526		540	487									400	787	*1219	*1232	F35

Note: * Not included in the standards.

STRAIGHTWAY
TAPER TWIN PLUG VALVES

CAST STEEL CLASS 900
RECTANGULAR PORT

Class	Max. CWP	Test Pressure	Pattern	Connections	Port	Materials	
						Body & Cover	Plug
900	2220 Psi	Shell 3350 Psi Seat 2442 Psi	Straight-way	Flanges R.F. or R.J. ASME B 16.5 Face to Face acc. to ASME B 16.10 Regular and Venturi Pattern Bleed: See Data sheet or Specified by purchaser	Rectan-gular	Cast Steel ASTM A 216 Grade WCB Cover: EN 10025 S355 J0 S355 J2G3	Cast Iron ASTM A 126 Class B / Steel

Operation: Manual worm gear with vertical handwheel CC	Operation: Manual worm gear with horizontal handwheel DD	Operation: Manual worm gear with one horizontal handwheel and one vertical hand-wheel DC
		

Plug	DN 6" – 18"	DN 6" – 18"	DN 6" – 18"
Cast Iron	55-AP 70174 CC-XXXX	55-AP 70174 DD-XXXX	55-AP 70174 DC-XXXX
Steel	55-AP 70177 CC-XXXX	55-AP 70177 DD-XXXX	55-AP 70177 DC-XXXX

XXXX : See data sheet page A12 or code sheet page A5

DN	A	B	D	H	I	J	L	M	N	O	P	Q	R	Raised Face V	Ring Joint V
6"	127	216	245	400	101/201	38	320	205	85	46	380	146	381	610	613
8"	158	252	305	500	101/201	38	386	230	95	70	447	191	470	737	740
10"	184	297	340	600	101/201	38	461	298	135	69	532	238	546	838	841
12"	208	334	400	600	101/201	38	505	337	160	108	576	283	610	965	968
14"	235	379	416	600	101/201	38	558	337	160	108	629	311	641	*1029	*1038
16"	260	450	464	700	101/201	38	589	360	175	130	660	356	705	1130	1140
18"	312	526	540	700	101/201	38	642	397	176	168	713	400	787	*1219	*1232

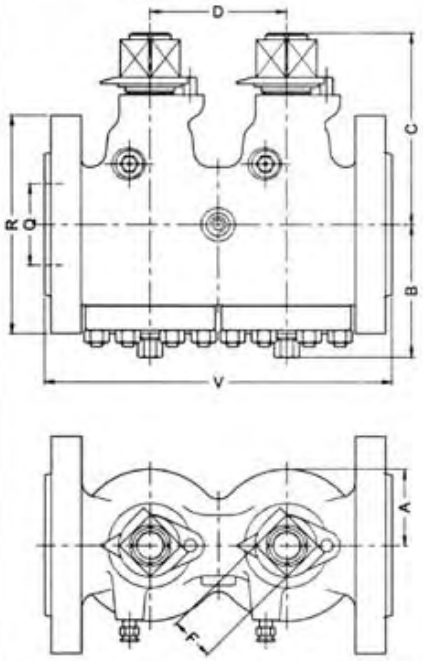
Note: * Not included in the standards.

STRAIGHTWAY
TAPER TWIN PLUG VALVES

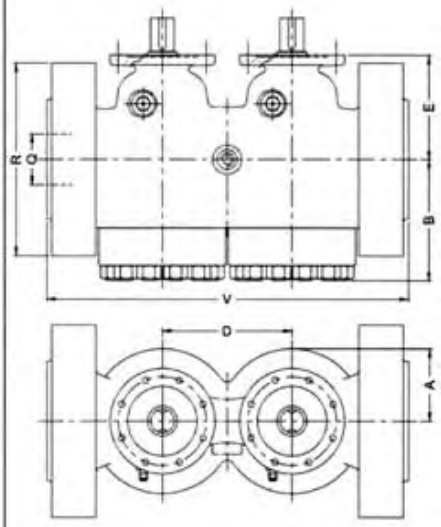
CAST STEEL CLASS 1500
RECTANGULAR PORT

Class	Max. CWP	Test Pressure	Pattern	Connections	Port	Materials	
						Body & Cover	Plug
1500	3705 Psi	Shell 5575 Psi Seat 4075 Psi	Straight-way	Flanges R.F. or R.J. ASME B 16.5 Face to Face acc. to ASME B 16.10 Regular and Venturi Pattern Bleed: See Data sheet or Specified by purchaser	Rectan-gular	Cast Steel ASTM A 216 Grade WCB Cover: EN 10025 S355 J0 S355 J2G3	Cast Iron ASTM A 126 Class B Steel

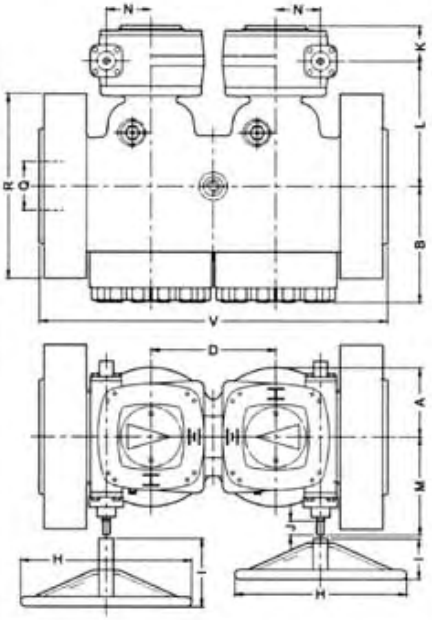
Operation: Manual by wrench. Type 8L



Operation: Bare stem with mounting flange for actuation "ISO 5211"



Operation: Manual worm gear with vertical handwheel.



Plug	DN 1" – 3"	DN 1" – 18"	DN 1" – 4"
Cast Iron	55-AP 70184 NN-XXXX	55-AP 70184 LL-XXXX	55-AP 70184 CC-XXXX
Steel	55-AP 70187 NN-XXXX	55-AP 70187 LL-XXXX	55-AP 70187 CC-XXXX

XXXX : See data sheet page A12 or code sheet page A5

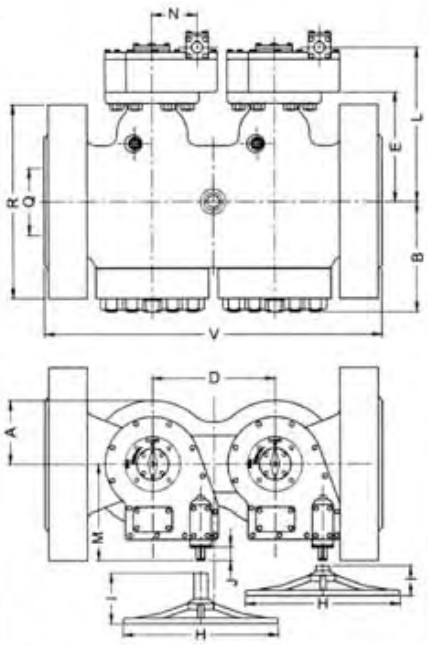
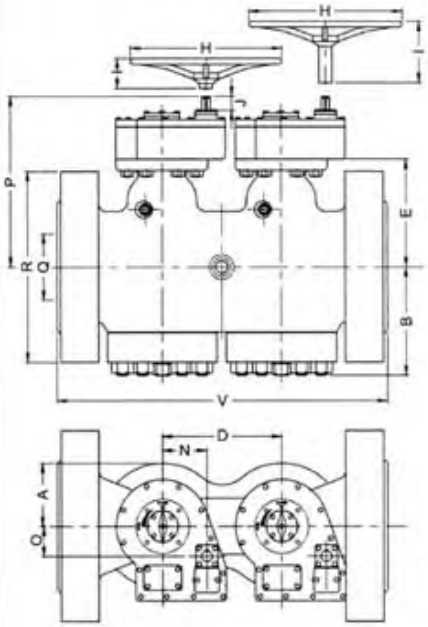
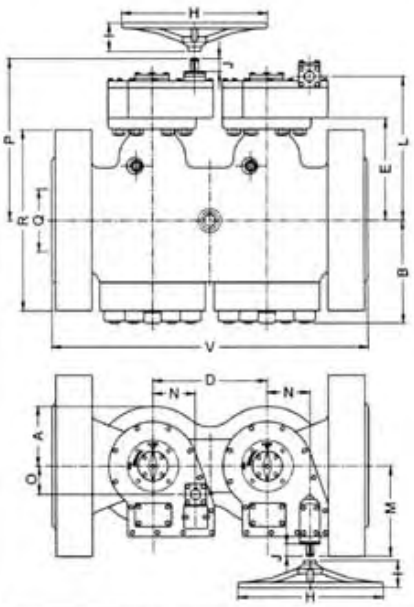
DN	A	B	C	D	E	F	H	I	J	K	L	M	N	Q	R	Raised Face V	Ring Joint V	ISO Flange 5211
1"	56	97	137	90	89	30								22	150	254	254	F07
2"	76	125	174	145	124	30	300	124/174	32	40	165	132	50	48	216	368	372	F10
3"	99	166	220	182	147	50	300	124/174	42	49	193	165	63	70	267	470	473	F12
4"	103	180		235	180		300	124/174	42	49	226	165	63	92	311	546	549	F12
6"	143	250		260	237									137	394	705	711	**F16
8"	169	281		300	263									178	483	832	842	**F25
10"	208	355		380	322									222	584	991	1000	F25
12"	243	406		452	397									264	673	1130	1146	F30
14"	243	406		492	406									289	749	*1257	*1276	F30
16"	276	460		560	466									330	826	1384	1407	F35
18"	312	522		640	526									372	914	*1537	*1559	**F35

Note: * Not included in the standards. ** With C and D-gear the ISO topworks is not according to this size.

STRAIGHTWAY
TAPER TWIN PLUG VALVES

CAST STEEL CLASS 1500
RECTANGULAR PORT

Class	Max. CWP	Test Pressure	Pattern	Connections	Port	Materials	
						Body & Cover	Plug
1500	3705 Psi	Shell 5575 Psi Seat 4075 Psi	Straight-way	Flanges R.F. or R.J. ASTM B 16.5 Face to Face acc. to ASME B 16.10 Regular and Venturi Pattern Bleed: See Data sheet or Specified by purchaser	Rectan-gular	Cast Steel ASTM A 216 Grade WCB Cover: EN 10025 S355 J0 S355 J2G3	Cast Iron ASTM A 126 Class B / Steel

Operation: Manual worm gear with vertical handwheel CC	Operation: Manual worm gear with horizontal handwheel DD	Operation: Manual worm gear with one horizontal handwheel and one vertical hand-wheel DC
		

Plug	DN 6" – 18"	DN 6" – 18"	DN 6" – 18"
Cast Iron	55-AP 70184 CC-XXXX	55-AP 70184 DD-XXXX	55-AP 70184 DC-XXXX
Steel	55-AP 70187 CC-XXXX	55-AP 70187 DD-XXXX	55-AP 70187 DC-XXXX

XXXX : See data sheet page A12 or code sheet page A5

DN	A	B	D	H	I	J	L	M	N	O	P	Q	R	Raised Face V	Ring Joint V
6"	143	250	260	400	101	38	338	205	85	46	398	137	394	705	711
8"	169	281	300	500	101	38	373	230	95	70	434	178	483	832	842
10"	208	355	380	600	101	38	477	298	135	69	548	222	584	991	1000
12"	243	406	452	600	101	38	552	337	160	108	623	264	673	1130	1146
14"	243	406	492	600	101	38	561	337	160	108	632	289	749	*1257	*1276
16"	276	460	560	700	101	38	621	397	176	168	692	330	826	1384	1407
18"	312	522	640	900	101	38	681	438	200	210	752	372	914	*1537	*1559

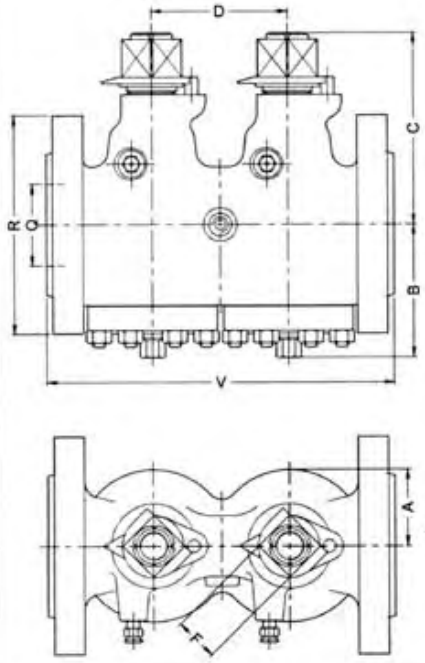
Note: * Not included in the standards.

STRAIGHTWAY
TAPER TWIN PLUG VALVES

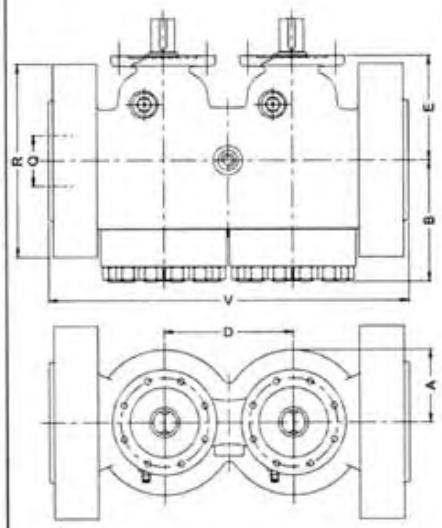
CAST STEEL CLASS 2500
RECTANGULAR PORT

Class	Max. CWP	Test Pressure	Pattern	Connections	Port	Materials	
						Body & Cover	Plug
2500	6170 Psi	Shell 9275 Psi Seat 6787 Psi	Straight-way	Flanges R.F. or R.J. ASME B 16.5 Face to Face acc. to ASME B 16.10 Regular Pattern Bleed: See Data sheet or Specified by purchaser	Rectan-gular	Cast Steel ASTM A 216 Grade WCB Cover: EN 10025 S355 J0 S355 J2G3	Cast Iron ASTM A 126 Class B Steel

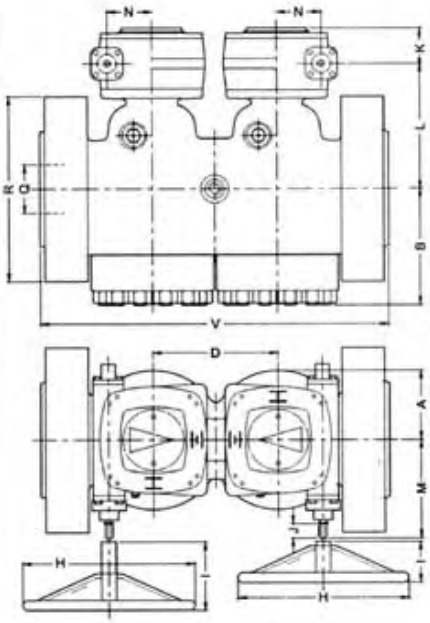
Operation: Manual by wrench.
Type 8L



Operation: Bare stem with mounting flange for actuation "ISO 5211"



Operation: Manual worm gear with vertical handwheel.



Plug	DN 2" – 3"	DN 2" – 16"	DN 2" – 3"
Cast Iron	55-AP 70194 NN-XXXX	55-AP 70194 LL-XXXX	55-AP 70194 CC-XXXX
Steel	55-AP 70197 NN-XXXX	55-AP 70197 LL-XXXX	55-AP 70197 CC-XXXX

XXXX : See data sheet page A12 or code sheet page A5

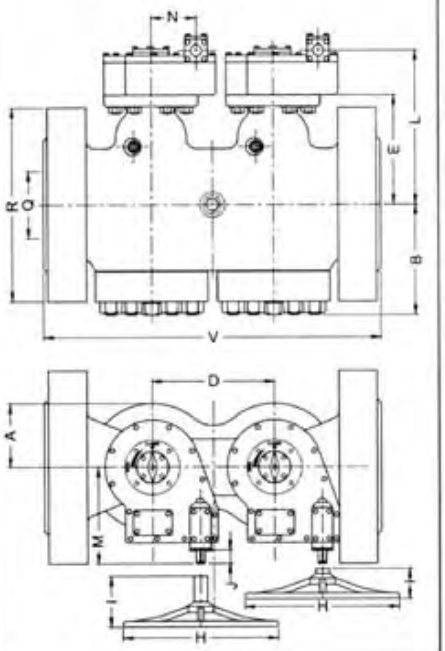
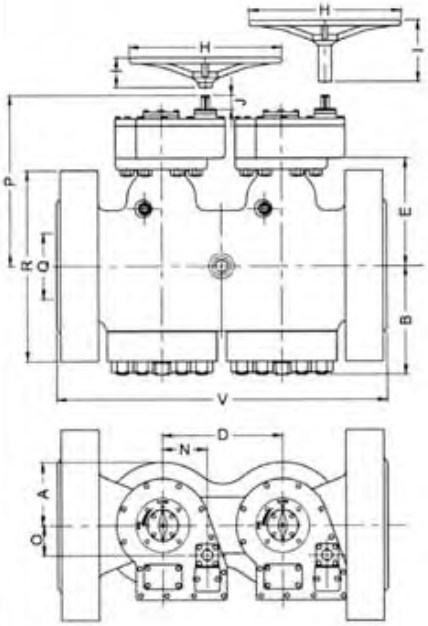
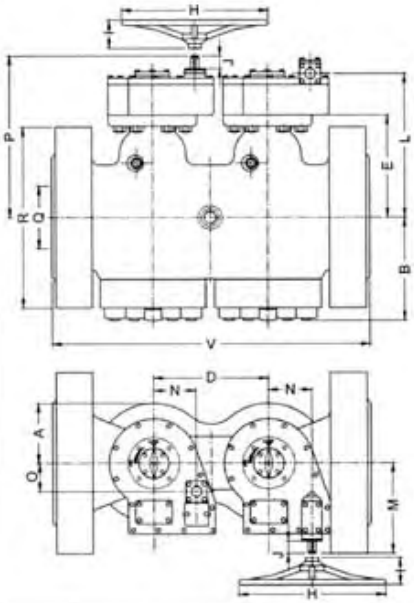
DN	A	B	C	D	E	F	H	I	J	K	L	M	N	Q	R	Raised Face V	Ring Joint V	ISO Flange 5211
2"	87	140	200	170	134	41	300	124/174	42	49	177	165	63	38	235	451	454	F10
3"	110	185	232	210	159	50	300	124/174	42	49	205	165	63	57	305	578	584	F12
4"	122	215		258	200									73	356	673	683	F14
6"	164	250		320	228									111	483	914	927	F16
8"	208	343		372	300									146	553	1022	1038	F25
10"	254	447		460	376									184	673	1270	1292	F30
12"	280	476		565	397									219	762	1422	1445	F35
14"	300	493		625	416									242	*	*1400	*1400	F35
16"	300	493		625	416									276	*	*1400	*1400	F35

Note: * Not included in the standards

STRAIGHTWAY
TAPER TWIN PLUG VALVES

CAST STEEL CLASS 2500
RECTANGULAR PORT

Class	Max. CWP	Test Pressure	Pattern	Connections	Port	Materials	
						Body & Cover	Plug
2500	6170 Psi	Shell 9275 Psi Seat 6787 Psi	Straight-way	Flanges R.F. or R.J. ASME B 16.5 Face to Face acc. to ASME B 16.10 Regular Pattern Bleed: See Data sheet or Specified by purchaser	Rectan-gular	Cast Steel ASTM A 216 Grade WCB Cover: EN 10025 S355 J0 S355 J2G3	Cast Iron ASTM A 126 Class B Steel

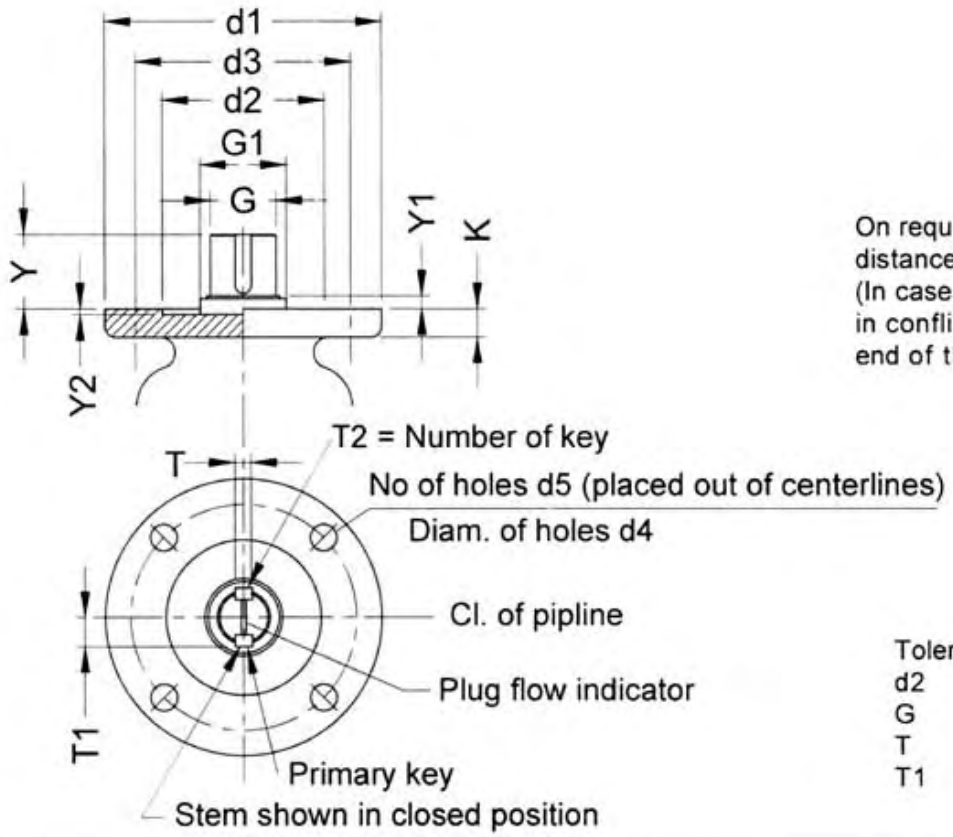
Operation: Manual worm gear with vertical handwheel CC	Operation: Manual worm gear with horizontal handwheel DD	Operation: Manual worm gear with one horizontal handwheel and one vertical hand-wheel DC
		

Plug	DN 4" – 16"	DN 4" – 16"	DN 4" – 16"
Cast Iron	55-AP 70194 CC-XXXX	55-AP 70194 DD-XXXX	55-AP 70194 DC-XXXX
Steel	55-AP 70197 CC-XXXX	55-AP 70197 DD-XXXX	55-AP 70197 DC-XXXX

XXXX : See data sheet page A12 or code sheet page A5

														Raised Face	Ring Joint
DN	A	B	D	H	I	J	L	M	N	O	P	Q	R	V	V
4"	122	215	258	400	101/201	38	301	205	85	46	361	73	356	673	683
6"	164	250	320	500	101/201	38	338	230	95	70	399	111	483	914	927
8"	208	356	372	600	101/201	38	455	298	135	69	526	146	553	1022	1038
10"	254	447	460	600	101/201	38	531	337	160	108	602	184	673	1270	1292
12"	280	476	565	700	101/201	38	552	360	175	130	623	219	762	1422	1445
14"	300	493	625	700	101/201	38	572	397	176	168	641	242	*	*1400	*1400
16"	300	493	625	700	101/201	38	572	397	176	168	641	276	*	*1400	*1400

Note: * Not included in the standards



On request, an additional distance ring can be delivered. (In case some of dimensions is in conflict with the connection end of the actuator).

Tolerances: ISO R.286
d2 = H9
G = g6
T = h9
T1 = Max dimension

Class 150															
DN	ISO	d1	d2	d3	d4	d5	G	G1	K	T	T1	T2	Y	Y1	Y2
1"	F07	90	55	70	9	4	20	32	11	6	12,5	1	34	7,5	3,5
2"	F07	90	55	70	9	4	24	35	11	8	15	1	46	7	3,5
3"	F07	90	55	70	9	4	30	42	11	8	18	1	47	8,5	3,5
4"	F10	125	70	102	11	4	34	47	12	10	20	1	57	8,5	3,5
6"	F12	150	85	125	13	4	50	67	13	14	28,5	1	67	8,5	3,5
8"	F14	175	100	140	18	4	60	78	17	18	34	1	78	11	4,5
10"	F16	210	130	165	22	4	68	86	22	20	38,5	1	79	10,5	5,5
12"	F16	210	130	165	22	4	68	86	22	20	38,5	2	92	10,5	5,5
14"	F16	210	130	165	22	4	-	-	22	-	-	-	-	-	5,5
16"	F25	300	200	254	18	8	-	-	27	-	-	-	-	-	5,5
18"	F25	300	200	254	18	8	-	-	27	-	-	-	-	-	5,5
20"	F25	300	200	254	18	8	-	-	27	-	-	-	-	-	5,5

Class 300															
DN	ISO	d1	d2	d3	d4	d5	G	G1	K	T	T1	T2	Y	Y1	Y2
1"	F07	90	55	70	9	4	20	32	11	6	12,5	1	34	7,5	3,5
2"	F07	90	55	70	9	4	24	35	11	8	15	1	46	7	3,5
3"	F10	125	70	102	11	4	30	42	12	8	18	1	57	8,5	3,5
4"	F10	125	70	102	11	4	34	47	12	10	20	1	57	8,5	3,5
6"	F14	175	100	140	18	4	50	67	17	14	28,5	2	77	8,5	4,5
8"	F14	175	100	140	18	4	60	78	17	18	34	1	78	11	4,5
10"	F16	210	130	165	22	4	68	86	22	20	38,5	2	92	10,5	5,5
12"	F16	210	130	165	22	4	68	86	22	20	38,5	2	92	10,5	5,5
14"	F25	300	200	254	18	8	-	-	27	-	-	-	-	-	5,5
16"	F25	300	200	254	18	8	-	-	27	-	-	-	-	-	5,5
18"	F30	350	230	298	22	8	-	-	32	-	-	-	-	-	5,5
20"	F30	350	230	298	22	8	-	-	32	-	-	-	-	-	5,5

Class 600															
DN	ISO	d1	d2	d3	d4	d5	G	G1	K	T	T1	T2	Y	Y1	Y2
1"	F07	90	55	70	9	4	20	32	11	6	12,5	1	34	7,5	3,5
2"	F07	90	55	70	9	4	24	35	11	8	15	1	46	7	3,5
3"	F10	125	70	102	11	4	30	42	12	8	18	1	57	8,5	3,5
4"	F12	150	85	125	13	4	40	53	13	12	23	1	67	7,5	3,5
6"	F14	175	100	140	18	4	50	67	17	14	28,5	2	77	8,5	4,5
8"	F16	210	130	165	22	4	60	78	22	18	34	1	88	10	5,5
10"	F25	300	200	254	18	8	68	86	27	20	38,5	2	92	10,5	5,5
12"	F25	300	200	254	18	8	82	105	27	22	46	2	108	10,5	5,5
14"	F30	350	230	298	22	8	82	105	32	22	46	2	108	10,5	5,5
16"	F30	350	230	298	22	8	82	105	32	22	46	2	108	10,5	5,5
18"	F35	415	260	356	33	8	90	120	37	25	50	2	139	12	5,5
20"	F35	415	260	356	33	8	105	140	37	28	58,5	2	142	13	5,5
24"	F40	475	300	406	39	8	115	150	42	32	64,5	2	170	13	8,5

Class 900															
DN	ISO	d1	d2	d3	d4	d5	G	G1	K	T	T1	T2	Y	Y1	Y2
1"	F07	90	55	70	9	4	20	32	11	6	12,5	1	34	7,5	3,5
2"	F10	125	70	102	11	4	24	35	12	8	15	1	56	7	3,5
3"	F10	125	70	102	11	4	27	39	12	8	16,5	1	57	7	3,5
4"	F12	150	85	125	13	4	34	47	13	10	20	1	67	8,5	3,5
6"	F14	175	100	140	18	4	50	67	17	14	28,5	2	77	8,5	4,5
8"	F16	210	130	165	22	4	60	78	22	18	34	1	92	10	5,5
10"	F25	300	200	254	18	8	68	86	27	20	38,5	2	101	10,5	5,5
12"	F30	350	230	298	22	8	82	105	32	22	46	2	108	10,5	5,5
14"	F30	350	230	298	22	8	90	120	32	25	50	2	139	12	5,5
16"	F35	415	260	356	33	8	90	120	37	25	50	2	139	12	5,5
18"	F35	415	260	356	33	8	115	150	37	32	64,5	2	145	13	5,5

Class 1500															
DN	ISO	d1	d2	d3	d4	d5	G	G1	K	T	T1	T2	Y	Y1	Y2
1"	F07	90	55	70	9	4	20	32	11	6	12,5	1	34	7,5	3,5
2"	F10	125	70	102	11	4	24	35	12	8	15	1	56	7	3,5
3"	F12	150	85	125	13	4	34	47	13	10	20	1	67	8,5	3,5
4"	F12	150	85	125	13	4	34	47	13	10	20	1	67	8,5	3,5
6"	F16	210	130	165	22	4	50	67	22	14	28,5	2	87	7	5,5
8"	F25	300	200	254	18	8	68	86	27	20	38,5	2	101	10,5	5,5
10"	F25	300	200	254	18	8	68	86	27	20	38,5	2	109	10,5	5,5
12"	F30	350	230	298	22	8	90	120	32	25	50	2	129	12	5,5
14"	F30	350	230	298	22	8	90	120	32	25	50	2	129	12	5,5
16"	F35	415	260	356	33	8	105	140	37	28	58,5	2	140	13	5,5
18"	F35	415	260	356	33	8	115	150	37	32	64,5	2	145	13	5,5

Class 2500															
DN	ISO	d1	d2	d3	d4	d5	G	G1	K	T	T1	T2	Y	Y1	Y2
2"	F10	125	70	102	11	4	27	38	12	8	16,5	1	56	7	3,5
3"	F12	150	85	125	13	4	34	47	13	10	20	1	67	8,5	3,5
4"	F14	175	100	140	18	4	40	53	17	12	23	1	77	6,5	4,5
6"	F16	210	130	165	22	4	50	67	22	14	28,5	2	87	7	5,5
8"	F25	300	200	254	18	8	68	86	27	20	38,5	2	109	10,5	5,5
10"	F30	350	230	298	22	8	82	105	32	22	46	2	129	10,5	5,5
12"	F35	415	260	356	33	8	90	120	37	25	50	2	129	12	5,5
14"	F35	415	260	356	33	8	105	140	37	28	58,5	2	140	13	5,5
16"	F35	415	260	356	33	8	105	140	37	28	58,5	2	140	13	5,5

A) Valve Lubrication

The valve is grease packed, i.e. the plug rests on a lubricating film in valve body. The lubricant has three functions: to protect the internal closing surfaces of the valve from corrosion, to seal the valve, and to contribute to easy handling. With an eye to achieving the best possible action, it is therefore important to relubricate the valve. Lubrication is carried out with a BC-Lubricant Gun (Manually with type BC-1 or Pneumatically with type BC-2). The tube of the lubricant gun has a "push-on-head" for direct connection to the valve lubricating nipple. This nipple is the giant Buttonhead Design found on most other valve designs in the industry. The valve should be in fully open position when relubricating. Where the medie is compressable (e.g. air or gas) relubrication can also take place in fully closed position. Do not lubricate too fast - the lubricating pressure must be allowed to distribute itself. If possible make a few minor turns of the plug to further the distribution of the lubricant on the sealing surfaces. Each closing member (plug) has one or more lubrication points, and the lubricant should be distributed equally between the different lubrication points. The interval and quantity of lubricant for relubrication depends on the working conditions, for instance the temperature, the operating frequency, and the need for tightness. (A high working temperature dries up the lubricant). In case however, where the medium is non-aggressive and the temperature is low, the need for relubrication will be small. It is a matter of experience, but as a guideline and starting point, the values in the table below can be used.
The lubrication of the gear is either grease filled gearbox or "principle of dry lubrication", meaning that a layer of antiseizing paste with a content of molybdenum disulphide is applied to bearings, teeth and worms.

Valve size	Interval for relubrication i working temp.			Quantity of lubricant of each plug			
					Number of strokes by using		Numbers of units on the
DN	Up to 60°C	60° to 120°C	120 to 200°C	In cm³	Gun type BC-1	Gun type BC-2	Gun type BC-2
1"	12 month.	6 month.	3 month.	1,3	1	1	
1 1/2"	-	-	-	1,5	1	2	
2"	-	-	-	1,8	1	2	
2 1/2"	-	-	-	2,0	1	2	
3"	-	-	-	2,4	2	3	
4"	-	-	-	4	3	4	
6"	-	-	-	10	6	10	0,1
8"	-	-	-	30	17	30	0,3
10"	-	-	-	45	25	45	0,45
12"	-	-	-	65	36	65	0,65
14"	-	-	-	95	52	95	0,95
16"	-	-	-	135	75	135	1,35
18"	-	-	-	180	100	180	1,8
20"	-	-	-	235	130	235	2,35
24"	-	-	-	325	180	325	3,25

B) Adjustment of Plug

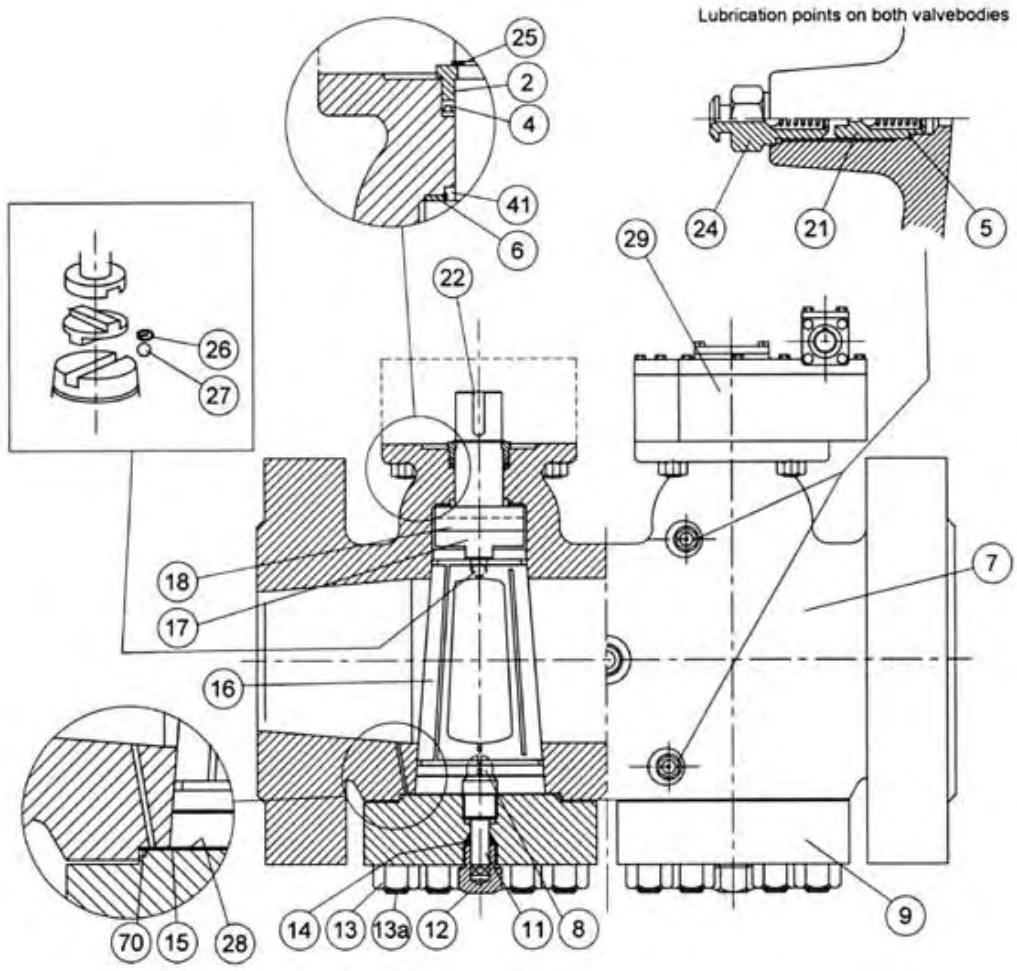
From the factory the plug is adjusted to the conical bore of the body, and normally it is never readjusted. Readjusting is only done when the valve - even after an effective lubrication, - is not tight.

Procedure:
First the bottom screw (12) placed on the underside of the bottom cover, is dismounted. Then the adjustment pressure screw (11) is tightened inwards very slowly while the plug is turned a little forwards and backwards.

The adjustment is a matter of feeling, and there is no exact tighten torque. As a guidance it can be observed, that the operating torque of the valve will increase, when direct contact between plug and body has been obtained. After adjusting, the bottom screw is remounted.

The adjusting can be done without dismounting the valve from the pipeline.

Important:
Normally it is advised, not to turn the adjustment pressure screws outwards. If this is done, there is a risk for the plug to slide out of the seat. Particles from the medium, will then be able to penetrate into the gap, which can result in damages on the closing surfaces.



Part No.:

2. Stembearing
4. Sealing Ring
5. Gasket
6. Thrust Plate
7. Body
8. Distance Piece
9. Bottom Cover
11. Pressure Screw
12. Bottom Screw
13. Nut
13a. Stud
14. Retaining Ring
15. Diaphragm
16. Plug
17. Equalizer Ring
18. Operating Stem
21. Check Valve
22. Parallel Key
24. Lubricant Screw
25. Snap Ring
26. Spring
27. Ball
28. Diaphragm
29. Gearbox
41. Fire Seal
70. Sealing Ring

C) Relubrication of Gear Boxes

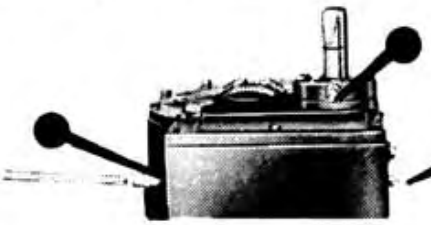
The gear bearings are lubricated through grease nipples once a year or so. Below the page shows the arrangement of the grease nipples on the two gear types. The gear tooth racks on worms and wheels are, as a rule, never lubricated. However, in case of trouble of control, making handling difficult, a penetrating and almost screaming sound will indicate a lack of lubrication. In such cases, a relubrication of the tooth racks is necessary. For gear type C or D, a removal of the gear covers is necessary to make the gear parts accessable. The lubrication paste is then applied to all tooth racks of both worms and worm wheels in a layer of about 1 mm. (Concentrated powdered molybdenum disulphide cannot be recommended, as layer thickness here is too thin).

Recommended lubricant:
For bearings, worms and gears: BCH G10.

Gear Type C and D are supplied with 2 threaded drain plugs - one in the cover of the gear, the other in the bottom. One of these plugs has a pressure relief valve. Please notice: This plug is always placed in the lower of the 2 thread holes.

Gear type C (horizontal stem).

Gear type D (vertical stem).

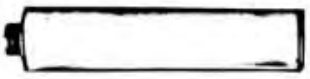


Lubrication of worm and wormgear.

D) Lubrication Guns.

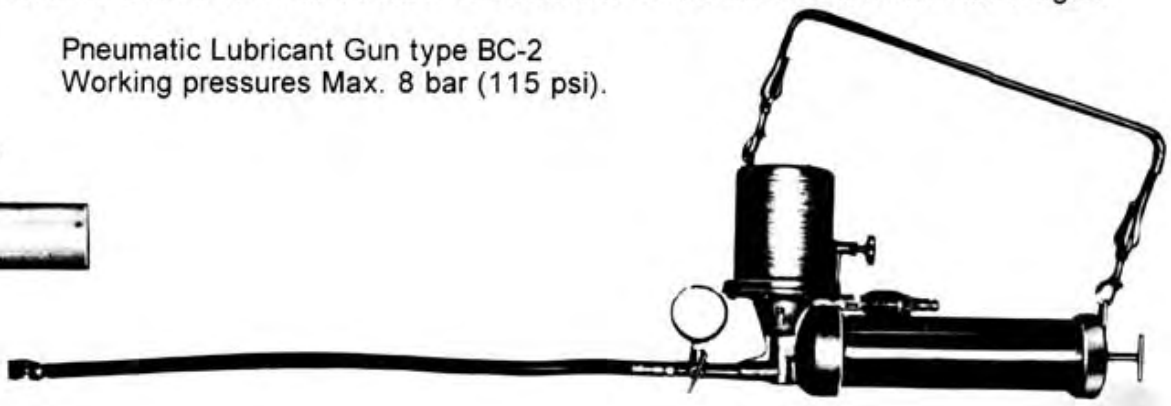
Manual Lubricant Gun type BC-1.

Cartridge for BC-1 300 ccm.



The lubricant gun type BC-1 is manual operated, which means the lubricant is pressed into the valve by a high pressure piston pump, when the arm is moved. By turning the handle at the rear end of the gun, the lubricant is pressed forwards against the piston pump. The handel is turned approximately ½ turn for each two/three strokes. The lubricant is delivered in 300 ccm cartridges.

Pneumatic Lubricant Gun type BC-2
Working pressures Max. 8 bar (115 psi).



Cartridge for BC-2 1250 ccm.

Standard Lubricants - These sealants to be used whenever possible for optimal performance.

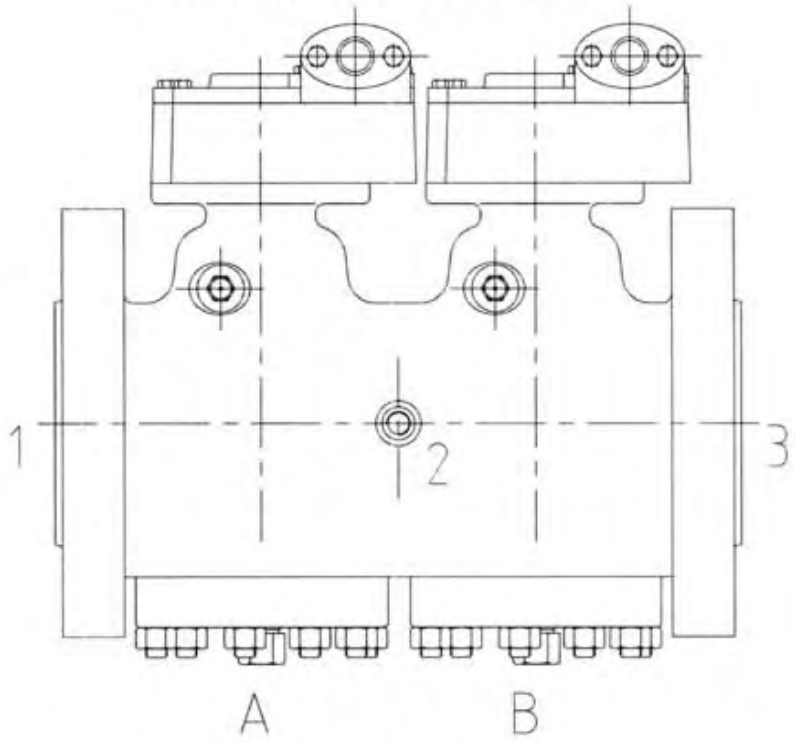
Lubricant no. PR	Colour of compound	Temperature Range C	Temperature Range F	RECOMMENDATIONS
80	Black	- 10 + 180	+ 14 + 356	**Cold and hot water** up to 180°c, conditional up to 200°C. Cold and hot air. 50% lye up to 50°C conditional up to 100°C, 50% acids up to 50°C, inorganic saline solutions up to 100°C, steam conditional up to 200°C. Suitable for town gas, propane, butane and natural gas. Not suitable for gas condensate.
711	Black	- 10 + 225	+ 14 + 437	**Petroleum products.** Butane and propane (max. 100°C). Gasoline, kerosene, asphalt and bitumen, oils and most hydrocarbon solvents. Also suitable for gases (max. 170°C). Cold and hot air. Not suitable for hot water, strong alkalis and aromatic

Special Lubricants - normally to be used only where the standard lubricants cannot be used.

Lubricant no. PR	Colour of compound	Temperature Range C	Temperature Range F	RECOMMENDATIONS
40	Clear	- 10 + 100	+ 14 + 212	Cold and warm water. General Aqueous Solutions. Alcohols.
45	Yellowish-beige clear	- 10 + 130	+ 14 + 266	For drinking water at max. 100°C, beer, mineral water, milk, cocoa, cream, ammonia compound, acids and alkali desinfecant, fruit-acid and alcohol.
60	White	- 30 + 250	- 22 + 482	All diluted and concentrated acids and lyes, fluorine, chlorine, bromine, iodine, phosphorus oxychloride, ozone, hydrogen peroxide, all organic solvents (except hydrogen fluorcide), all mineral, vegetable and animal oils and fats. Do not affect elastomers and plastics.
103	Green	- 30 + 200	- 22 + 392	General purpose synthetic sealant for liquid and gaseous aliphatic hydrocarbon service suitable for gasoline, kerosene, fuel oils, crude distillates, aviation and jet fuel, natural gas. Not suitable for steam, aromatic solvents, strong acids and alkalies.
280	Black	- 10 + 200	+ 14 + 392	Cold and hot air up to 200°C. Cold and hot water up to 180°C. Cold and hot gases up to 150°C. Not suitable for strong acids, petroleum products and aromatic and chlorinated solvents.
* 330	White	- 30 + 250	- 22 + 482	Hot water and gases. Natural gas, propane, butane, asphalt and bitumen. General chemical aqueous solutions eg. alkalis and dilute acids. It is useful for hot air. Not suitable for light liquid hydrocarbons, aromatic and chlorinated solvents and strong mineral acids.

* This type of lubricant ought to be avoided, if one of the other types can be used, as this contain silicone oil. The operating torque of the valve will increase considerably.
For exceptional working conditions and services not mentioned in the table, please ask for further information.

Pressure testing of Twin plug valve.



Test No.

1. Test of shell. The shell is tested with both the plugs in open position.
2. Test of plug A in closed position and plug B in open position, pressure at flange no.1.
3. Test of plug B in closed position and plug A in open position, pressure at flange no.3.
4. Test of plug A and B in closed position and pressure at flange no.1 and 3.
5. Test of plug A and B in closed position and pressure at flange no.2.

Test no.	Pressure (bar)	Medium	Test duration (min)	Lubrication	Maximum Permissible leakage rate
1	1)	water	5	3)	No leakage
2	2)	water	5	3)	4)
3	2)	water	5	3)	4)
4	2)	water	5	3)	4)
5	2)	water	5	3)	4)
2	2)	water	5	711	No leakage
3	2)	water	5	711	No leakage
4	2)	water	5	711	No leakage
5	2)	water	5	711	No leakage
2	4-6	air	5	711	No leakage
3	4-6	air	5	711	No leakage
4	4-6	air	5	711	No leakage
5	4-6	air	5	711	No leakage

1) Hydrostatic Shell test (see page C7).
2) Hydrostatic seat test (see page C7).
3) Tested without lubricant 711.
4) Maximum allowed leakage = Valve DN^2 x 0,25 ml / min.

After assembling, before delivery, all Christensen Plug Valves pass through a careful pressure test.
The test is carried out acc. to the following standards: ASME B 16.34, BS 1560, BS 6755 API 598 and ASME B16.1.
If the customer or his representative wants to participate at the test - or, if there are special requirements to the pressure testing, this must be arranged with the manufacturer and stipulated in the purchase order.

Material	ASME B 16.1		(1/2" to 12") Class 125	250				(14" to 36") Class 125	250
Semi Steel ASTM A126 Class B	Maximum Cold Working Pressure	PSI	200	500				150	300
		BAR	13,8	34,5				11	21
	Hydrostatic Shell Test	PSI	300	750				230	450
		BAR	20,7	51,8				16	30
	Seat Test	Min. PSI	220	550				165	
		Min. BAR	15,2	37,9				12	

Material			Class 150	300	400	600	900	1500	2500
Carbon Steel ASTM A216 Gr. WCB	Maximum Cold Working Pressure	PSI	285	740	990	1480	2220	3705	6170
		BAR	19,6	51,1	68,1	102,1	153,2	255,3	425,5
	Hydrostatic Shell Test	PSI	450	1125	1500	2225	3350	5575	9275
		BAR	30	77	103	154	230	383	639
	Seat Test	Min. PSI	315	815	1090	1630	2442	4075	6787
		Min. BAR	21,5	56,2	74,9	112,3	168,5	280,8	468

Material			Class 150	300	400	600	900	1500	2500
Carbon Steel ASTM A352 Gr. LCB	Maximum Cold Working Pressure	PSI	265	695	925	1390	2085	3470	5785
		BAR	18,4	47,9	63,8	95,9	143,8	239,4	399
	Hydrostatic Shell Test	PSI	400	1050	1400	2100	3150	5225	8700
		BAR	28	72	96	144	216	360	599
	Seat Test	Min. PSI	292	765	1018	1529	2294	3817	6364
		Min. BAR	20,2	52,7	70,2	105,5	158,2	263,3	438,9

Material			Class 150	300	400	600	900	1500	2500
Stainless Steel ASTM A351 Gr. CF8M	Maximum Cold Working Pressure	PSI	275	720	960	1440	2160	3600	6000
		BAR	19,0	49,6	66,2	99,3	148,9	248,1	413,6
	Hydrostatic Shell Test	PSI	425	1100	1450	2175	3250	5400	9000
		BAR	29	75	100	149	224	373	621
	Seat Test	Min. PSI	303	792	1056	1584	2376	3960	6600
		Min. BAR	20,9	54,6	72,8	109,2	163,7	272,9	454,9

Material			Class 150	300	400	600	900	1500	2500
ASTM A216 Gr.WCC ASTM A352 Gr. LCC ASTM A352 Gr. LC2 ASTM A890 Gr. 4A	Maximum Cold Working Pressure	PSI	290	750	1000	1500	2250	3750	6250
		BAR	20	51,7	69	103,4	155,2	258,6	431,0
	Hydrostatic Shell Test	PSI	450	1125	1500	2250	3375	5625	9375
		BAR	30	78	104	156	233	388	647
	Seat Test	Min. PSI	319	825	1100	1650	2475	4125	6875
		Min. BAR	22	56,9	75,9	113,7	170,7	284,5	474

	Class 150				Class 300				Class 400				Class 600	
	Run Torque Nm	Break Torque Nm	Weight Kg	CV. Usgal/m	Run Torque Nm	Break Torque Nm	Weight Kg	CV. Usgal/m	Run Torque Nm	Break Torque Nm	Weight Kg	CV. Usgal/m	Run Torque Nm	Break Torque Nm
DN 1"	18	27	14,6	56	23	35	16	56	30	45	16	56	39	59
DN 2"	48	72	25	175	69	104	25	175	71	107	28	175	118	177
DN 3"	82	123	41	343	121	182	45	343	126	189	52	346	214	321
DN 4"	138	207	76	603	205	308	85	603	208	312	83	603	364	546
DN 6"	326	489	154	1391	478	717	173	1391	520	780	202	1401	906	1359
DN 8"	548	822	235	2420	796	1194	255	2420	887	1331	256	2358	1514	2271
DN 10"	665	998	280	3471	1380	2070	525	3923	1155	1733	543	3370	1954	2931
DN 12"	971	1457	450	5053	1441	2162	495	5053	1776	2664	687	4947	2987	4481
DN 14"	1166	1749	508	6164	1762	2643	578	6164	2080	3120	780	5800	3327	4991
DN 16"	1559	2339	539	8288	2458	3687	645	8288	2867	4301	869	7723	4681	7022
DN 18"	2008	3012	1138	10796	3200	4800	1284	10460	3886	5829	1754	9808	6312	9468
DN 20"	2510	3765	1570	13729	4190	6285	1719	13337	5046	7569	2360	12206	8309	12464
DN 24"									8244	12366	3210	18420	13585	20378

	Class 600		Class 900				Class 1500				Class 2500			
	Weight Kg	CV. Usgal/m	Run Torque Nm	Break Torque Nm	Weight Kg	CV. Usgal/m	Run Torque Nm	Break Torque Nm	Weight Kg	CV. Usgal/m	Run Torque Nm	Break Torque Nm	Weight Kg	CV. Usgal/m
DN 1"	16	56	47	71	23	46	68	102	23	46				
DN 2"	30	175	112	168	56	142	178	267	56	142	173	260	85	90
DN 3"	55	346	203	305	75	303	383	575	112	315	430	645	168	210
DN 4"	87	603	362	543	110	545	546	819	157	490	691	1037	295	332
DN 6"	210	1401	956	1434	260	1242	1226	1839	370	1067	2017	3026	647	796
DN 8"	274	2358	1748	2622	456	2094	2053	3080	646	1769	3997	5996	951	1481
DN 10"	571	3370	2795	4193	715	3199	3393	5090	1170	2762	6109	9164	1850	2239
DN 12"	715	4947	3701	5552	1050	4350	6379	9569	1915	4110	7298	10947	3081	2897
DN 14"	810	5800	5176	7764	1546	5433	6083	9125	2548	4656	9984	14976	*2410	3657
DN 16"	905	7723	7313	10970	1850	7181	8144	12216	3250	6104	9984	14976	*2410	4307
DN 18"	1800	9808	10396	15594	2575	9352	11694	17541	4652	7984				
DN 20"	2410	12206												
DN 24"	3610	18420												

The torque are the maximum value of the valve, this are based on the following conditions:

Full differential pressure.
The valve is lubricated.
The temperature is 20° Celsius (Ambient)
Please note, no safety factor included in the valve values
* The weight is for grayloc Clamp ends

The weight is for flange valves with ISO top flange. (The weight is approximate only).

To convert Nm to foot lb. Multiply by 0.738 (1Nm = 0.738 ftlb)

STRAIGHTWAY
TAPER TWIN PLUG VALVES

TWIN PLUG VALVE FACT SHEET

* True double isolation giving two blocks in line all in one valve. (This differs from a DB&B ball valve). The twin plug design offers two blocks in the same direction.

* Lower costs, weight & size compared to the installation of two valves. (two balls or two plugs)

* Standard face to face dimensions in most sizes/classes allows for simple retrofit to a single ball, gate or plug valve.

* High integrity metal to metal seats associated with the tapered lubricated plug valve design.

* Thread less stem incorporating three independent seals.

* Pressure balanced for low torque, reliable operation.

* Patented Pressure Relief Design to prevent pressure buildup between the two plugs due to thermal or environmental forces. This system vents only to pipe area not atmosphere.

* Flow rates comparable to the single plug configuration

* Field proven in some of the most arduous field sites (erosive and/or dirty applications)

* Low cost compared to a single expanding type Double Block & Bleed Gate valve or two ball valves.

* Verifiable isolation at all times. Bleed port allows easy accurate assessment of seating integrity at any time.

* Self protecting design actually causes one plug to protect the other. The whole is greater than the sum of its parts. Second plug prevents wiredraw on first plug. First plug witnesses the erosive flow during initial open & final closure.

* Bidirectional design - valve can be installed in any position including upside down.

* Bleed available on either side of body and any end connection.

* Valves also available in Hub ends, weld ends and ASME class 125 and 250.

* Meets industry standards, firesafe, API, ASME, ISO etc.

BRDR. CHRISTENSENS HANER A/S

Skuderløse, 4690 Haslev, Denmark
Tlf. +45 56 36 36 36 - Fax +45 56 36 36 00
Website: www.bch.dk
E-mail: bch@bch.dk

DTP, repro og tryk: Glumsø Bogtrykkeri A/S. Miljøcertificeret efter ISO 14001