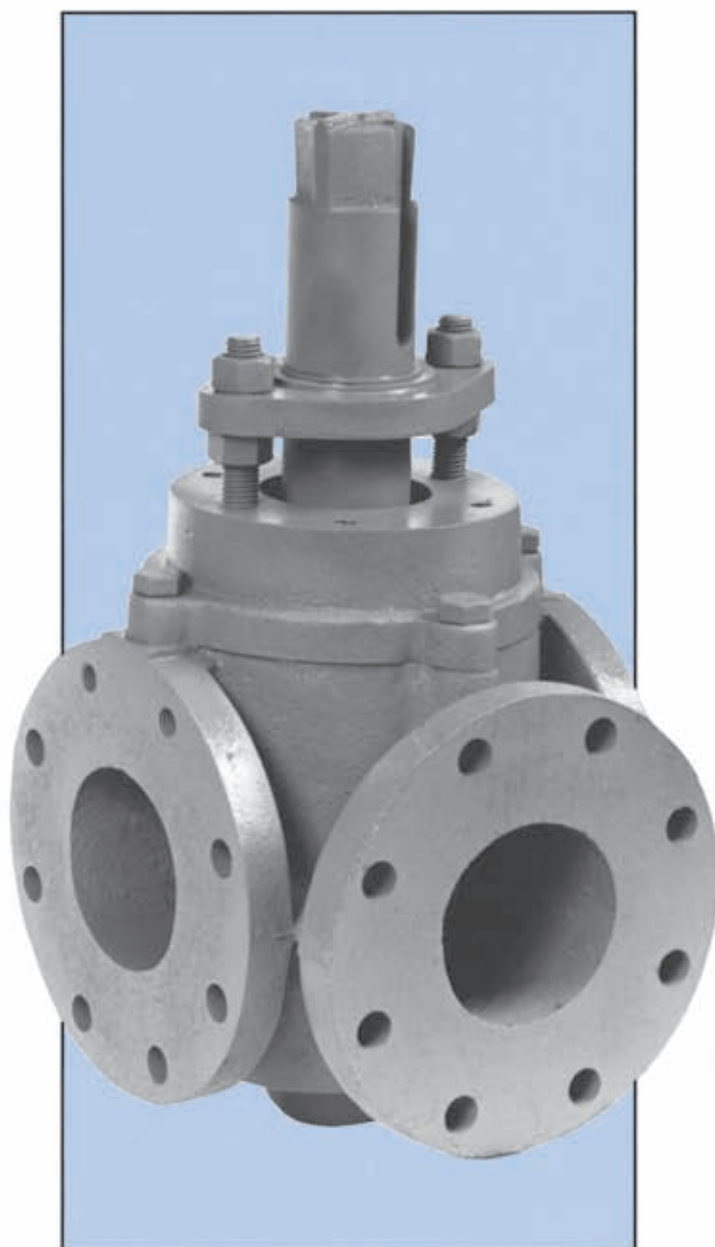


MILLIKEN

MILLCENTRIC

— MULTIPORT PLUG VALVE —



MILLIKEN

MILLCENTRIC

MULTIPOINT PLUG VALVE

The Milliken criteria of Quality, reliability, safety and value are embodied in the MILLCENTRIC Multipoint plug valve, setting higher standards for dependable performance with excellent features achieved by the utilization of the very latest design and manufacturing techniques.

- Computer Aided Design
- High integrity casting
- CNC manufacturing delivers consistent sizes on all components

All Complemented by rigorous Quality Control System

BODY

Millcentric valve body casting is of ASTM A-126 Class B iron using high pressure molding techniques for consistent quality and precision. Flange diameter, drilling and thickness conform to ANSI B 16.1 Class 125.

PLUG

Supported on integral trunnions, the solid ductile iron tapered plug is faced with any of a variety of elastomers that are vulcanized in place and ground to size. Plug position and shut off is controlled by use of adjustment gland attached to the plug shaft.

SEAT

The Multipoint MILLCENTRIC valve employs a corrosion and abrasion resistant epoxy seat on all sizes.

BONNET SEAL

Superior "O" ring sealing with metal/metal contact means lower stresses compared to traditional compression gaskets.

STEM SEAL

Multiple self-adjusting "U" cup seals are used to prevent stem leakage and provide years of trouble free service.

FLOW

The wide port design with streamlined internal contours allows for a high capacity flow in the full open position reducing turbulence and pressure drop through the valve.

BEARINGS

The plug rotates in oil impregnated sintered 316 grade stainless steel bearings located in both the body and bonnet.

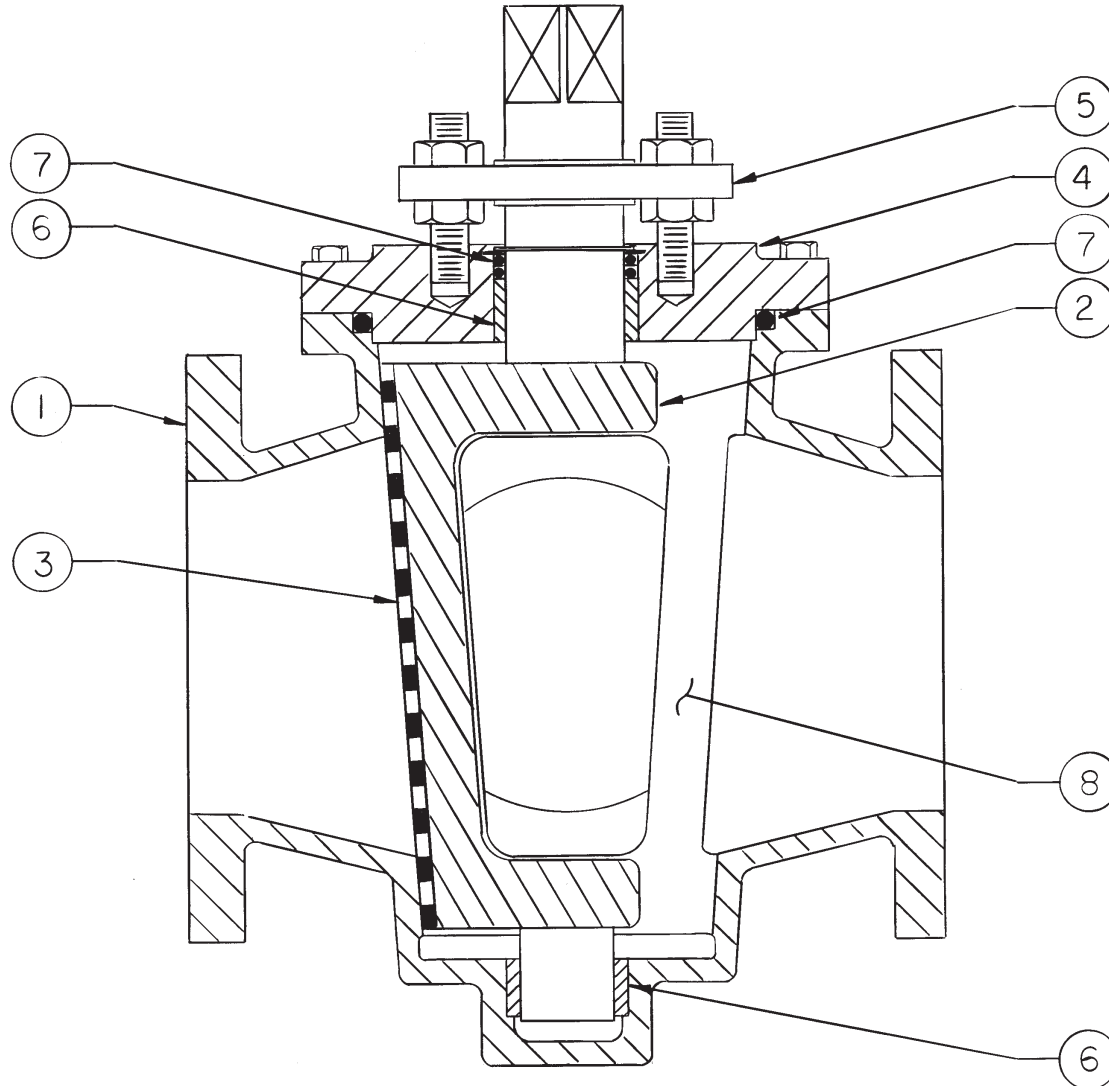
POSITION INDICATION

Active port indication is standard on all wrench operated and gear operated MILLCENTRIC Multipoint valves. See page 5 for flow patterns.

THE MULTIPOST MILLCENTRIC VALVE

Combining simplicity of design with high quality manufacturing processes, the Multiport Millcentric valve provides high flow and large solids passage. A four inch Multiport allows a 3" round solid to pass without compression. This fact permits smaller valves to be used without sacrificing flow integrity.

In the unlikely event wear occurs between the plug face and the body seal, the plug can be adjusted externally with the turn of a wrench. The Millcentric Multiport is excellent for directional control applications. Drip tight shut-off is available by special request. Contact Milliken for special pricing.



MATERIALS OF CONSTRUCTION

ITEM	DESCRIPTION	MATERIAL	SPECIFICATION
1	BODY	CAST IRON	ASTM A 126 CLB
2	PLUG	DUCTILE IRON	ASTM A 536
3	PLUG COATING	ELASTOMER	AS SPECIFIED
4	BONNET	CAST IRON	ASTM A 126 CLB
5	GLAND	DUCTILE IRON	ASTM A 536
6	BEARINGS	STAINLESS STEEL	AISI 316
7	SEALS	ELASTOMER	AS SPECIFIED
8	SEAT	EPOXY	—

ELASTOMERS AVAILABLE FOR 3" THROUGH 12" MULTIPOINT VALVES

NEOPRENE

This versatile elastomer shows outstanding resistance to abrasion. Chemical resistance to a wide range of petroleum based products, dilute acids/alkalies and ozone enhance Neoprene as a good choice for those applications. The temperature range is -20 F to 225 F.

NITRILE

A general purpose material also referred to as BUNA-N or HYCAR with a -20 F to 225 F temperature range. Used on sewage, water, hydrocarbons, sewage gases and mineral oils.

EPDM

An excellent polymer for use on chilled and hot water HVAC applications. EPDM has a temperature range of -35 F to 250 F. Resistance to many acids, alkalies, detergents, phosphate esters, alcohols and glycols is an added benefit.

VITON

Retention of mechanical properties at high temperature is the major feature of this synthetic elastomer. The temperature range is -10 F to 400 F. While more expensive than the above elastomers Viton does offer excellent resistance to oils, fuels, lubricants and many mineral acids and aromatic hydrocarbons.

PRESSURE RATING

3" - 16" ANSI 125 175 CWP

ORDERING INFORMATION

MILLCENTRIC VALVE - SERIES 600

VALVE TYPE	DESIGNATION
ANSI 125 Flanged	604

SEAT	
Epoxy	E

PLUG ELASTOMER	
EPDM	0
NITRILE (BUNA)	1
VITON	2
NEOPRENE	3

GEAR OPERATOR	
Handwheel Gear with 90 Degree Quadrant	AG
Handwheel Gear with 360 Degree Quadrant	AGX

Example

4" 604 E3 AG STYLE C

4" Three Way valve with epoxy seat, Neoprene Plug with a 90 degree turn gear.

ELASTOMER SELECTION CHART

The chart below is to assist in the selection of elastomers for some common fluids. It doesn't mean other elastomers are not suitable within varying limits. Temperature, concentration, and mixture all affect

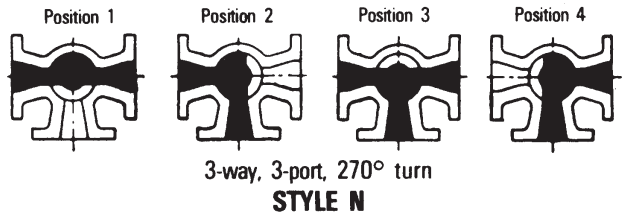
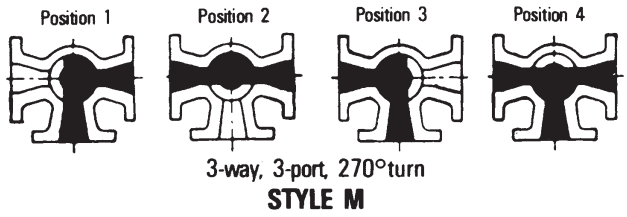
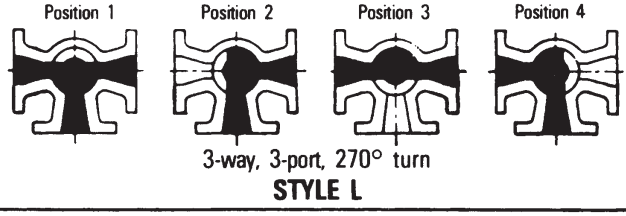
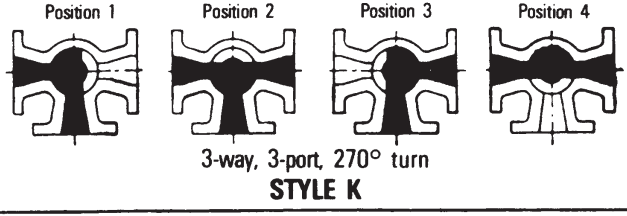
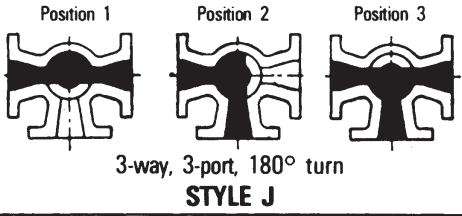
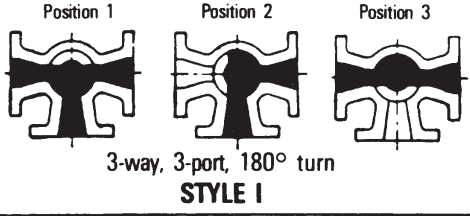
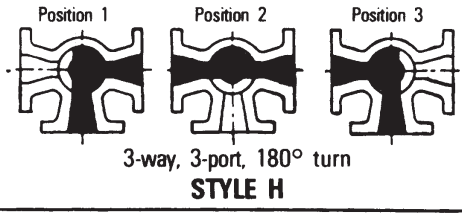
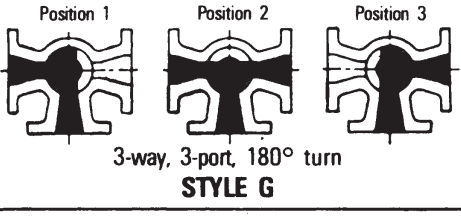
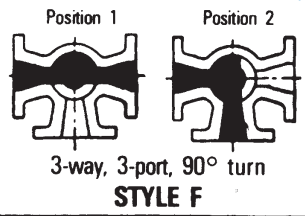
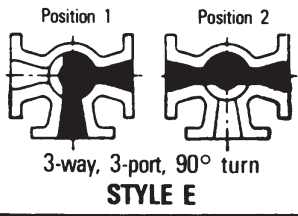
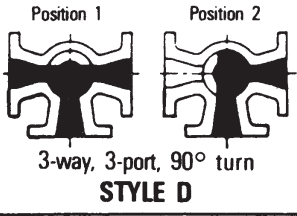
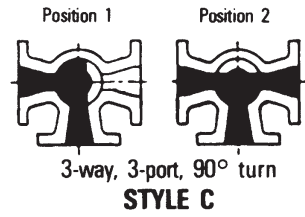
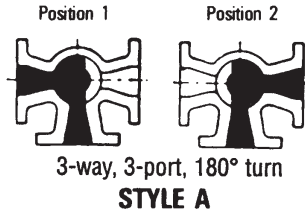
chemical attack. If there is any doubt regarding compatibility, specific conditions should be referred to engineering for recommendations. The chart below is to serve as a guide only.

Service	Elastomer	Average Useful Temp. Range	Service	Elastomer	Average Useful Temp. Range	Service	Elastomer	Average Useful Temp. Range
Acetone	EPDM	-35°F to 250°F	Caustic Soda	EPDM	-35°F to 250°F	Oil, Animal	Nitrile	-20°F to 212°F
Air	EPDM	-35°F to 250°F	Cement Slurry	EPDM	-35°F to 250°F	Oil, Mobil Therm Light	Viton	10°F to 250°F
Air w/Oil	Nitrile	0°F to 212°F	Copper Sulphate	EPDM	-35°F to 250°F	Oil, Mobil Therm 600	Viton	10°F to 250°F
Alcohol, Amyl	EPDM	0°F to 212°F	Creasote (Coal)	Nitrile	-20°F to 212°F	Oil, Mobil Therm 603	Nitrile	-20°F to 212°F
Alcohol, Aromatic	Viton	10°F to 250°F	Coal Slurry	Nitrile	-20°F to 212°F	Oil, Lubricating	Nitrile	-20°F to 212°F
Alcohol, Butyl	Neoprene	-20°F to 225°F	Diesel Fuel No. 1	Nitrile	-20°F to 212°F	Oil, Vegetable	Nitrile	-20°F to 212°F
Alcohol, Denatured	Nitrile	-20°F to 212°F	Diethylene Glycol	EPDM	-35°F to 250°F	Paint, Latex	Nitrile	-20°F to 212°F
Alcohol, Ethyl	EPDM	-35°F to 250°F	Ethylene Glycol	EPDM	-35°F to 250°F	Phosphate Ester	EPDM	-35°F to 250°F
Alcohol, Grain	Nitrile	-20°F to 225°F	Fatty Acid	Nitrile	-20°F to 212°F	Propane	Nitrile	-20°F to 212°F
Alcohol, Isopropyl	Neoprene	-20°F to 225°F	Fuel Oil No.2	Nitrile	-20°F to 212°F	Rape Seed Oil	EPDM	-35°F to 250°F
Alcohol, Methyl	EPDM	-35°F to 250°F	Fertilizer Liquid (H ₄ N ₂ O ₂)	EPDM	-35°F to 250°F	Sewage (w/oils)	Nitrile	-20°F to 212°F
Ammonia, Anhydrous	Neoprene	-20°F to 225°F	Gasoline, Keg	Nitrile	-20°F to 212°F	Sodium Hydroxide 20%	EPDM	-35°F to 250°F
Ammonium Nitrate	EPDM	-35°F to 250°F	Gas, Natural	Nitrile	-20°F to 212°F	Starch	EPDM	-35°F to 250°F
Ammonia, Water	EPDM	-35°F to 250°F	Glue, Animal	Nitrile	-20°F to 212°F	Steam to 300°F	EPDM	-35°F to 300°F
Animal Fats	Nitrile	-20°F to 212°F	Green Liquor	EPDM	-35°F to 250°F	Stoddard Solvent	Nitrile	20°F to 80°F
Black Liquor	EPDM	-35°F to 250°F	Hydraulic Oil (Petro)	Nitrile	-20°F to 212°F	Sulphuric Acid 10%-50%	Neoprene	-35°F to 158°F
Blast Furnace Gas	Neoprene	-20°F to 225°F	Hydrogen	Nitrile	-20°F to 212°F	Sulphuric Acid 100%	Viton	10°F to 300°F
Butane	Nitrile	-20°F to 212°F	JP4, JP5	Viton	0°F to 300°F	Trichloroethylene Dry	Viton	10°F to 250°F
Bunker Oil "C"	Nitrile	-20°F to 212°F	Kerosene	Nitrile	-20°F to 212°F	Triethanol Amine	EPDM	-35°F to 300°F
Calcium Chloride	EPDM	-35°F to 250°F	Ketone	EPDM	-35°F to 250°F	Varnish	Viton	10°F to 300°F
Carbon Dioxide	EPDM	-35°F to 250°F	Lime Slurry	EPDM	-35°F to 250°F	Water, Fresh	EPDM	-35°F to 250°F
Carbon Monoxide (Cold)	Neoprene	-20°F to 150°F	Methane	Nitrile	-20°F to 212°F	Water, Salt	EPDM	-35°F to 250°F
Carbon Monoxide (Hot)	Viton	10°F to 300°F	Methyl Ethyl Ketone	EPDM	-35°F to 250°F	Xylene	Viton	10°F to 300°F
Carbon Tetrachloride	Viton	10°F to 300°F	Naptha (Berzin)	Nitrile	-20°F to 212°F			

VALVE PATTERNS

Three-Way Valve Port Positions

(View is from top of Valve)



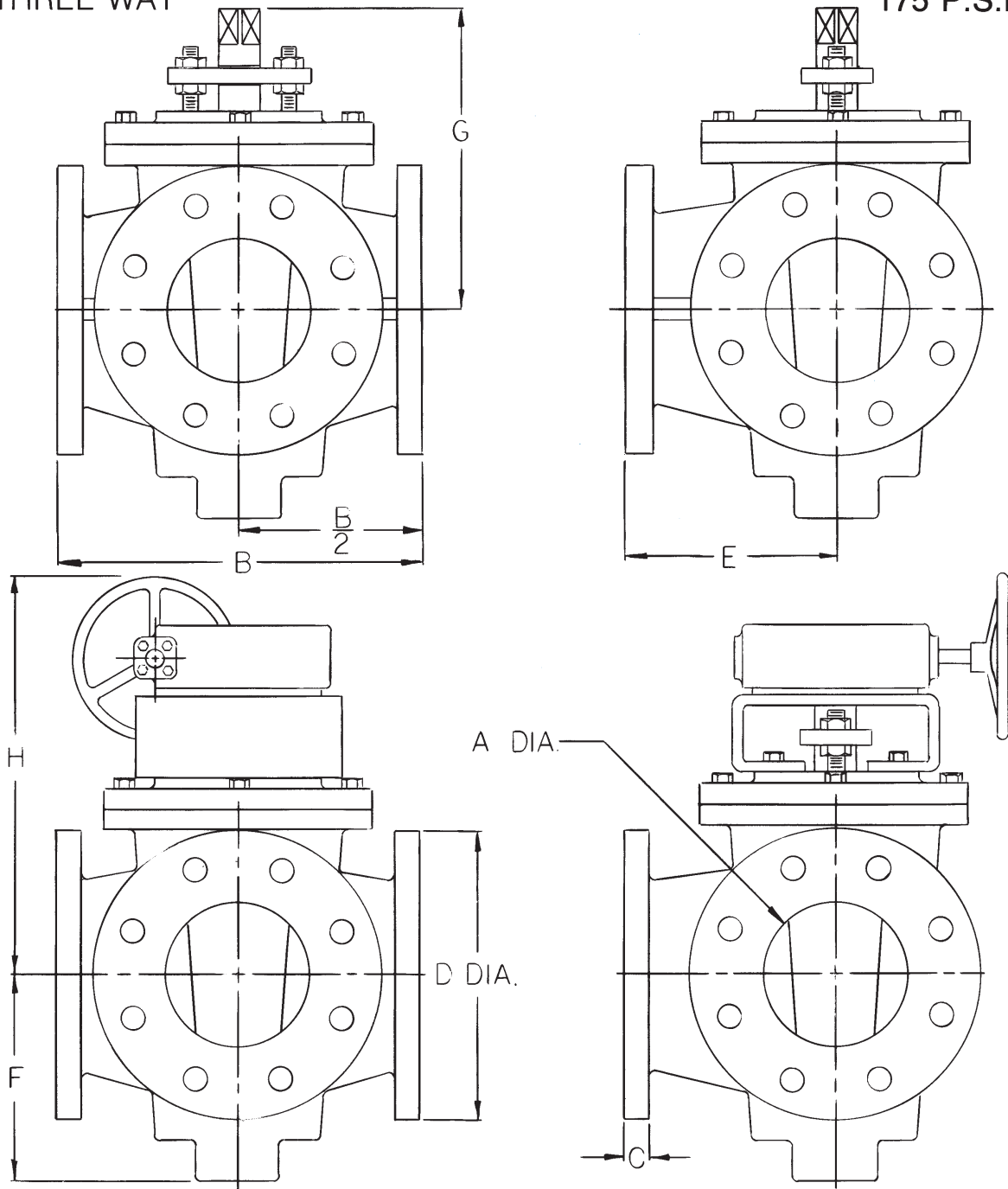
HOW TO ORDER

When ordering three-way valves specify the size and figure number of the valve, plus the style letter of the port position desired.

Fig. 604E

THREE WAY

175 P.S.I.



VALVE SIZE	A	B	C	D	E	F	G	H	WEIGHT	
									W.O.	G.O.
3"	3	8.00	.75	7.5	5.50	4.75	9.13	15.13	65	110
4"	4	9.88	.94	9.0	6.50	6.00	13.63	19.13	120	200
6"	6	11.63	1.00	11.0	8.00	7.06	15.13	20.38	170	250
8"	8	13.88	1.13	13.5	9.00	11.00	19.13	24.50	325	405
10"	10	16.75	1.19	16.0	11.00	11.00	19.13	24.50	380	460
12"	12	19.00	1.25	19.0	11.56	12.88	21.25	26.50	475	555
14"	14	21.00	1.38	21.0	12.50	14.38	N/A	29.00	N/A	937
16"	16	23.75	1.44	23.25	15.13	15.88	N/A	31.13	N/A	1053

MILLIKEN VALVE COMPANY

TERMS AND CONDITIONS OF SALE

ACCEPTANCE

The terms and conditions contained herein and attached hereto shall apply to all sales by Seller and no understanding, agreement, term, condition or trade custom at variance herewith shall be binding on the Seller. Any prior terms in Buyer's documents are specifically objected to and rejected. Any proposal for additions or different terms or any attempt by buyer to vary, in any degree any of these terms in Buyer's acceptance by Purchase Order or otherwise is objected to and shall not operate as a rejection of this offer to sell unless such variance is in the terms of description, quantity or price of goods, but shall be deemed accepted by Buyer without said additional or different terms. If this document is to be deemed an acceptance of a prior offer by buyer, such acceptance is expressly conditioned on buyer's assent to any additional or differing terms contained herein.

The seller shall not be bound by any contract until approved in writing by an officer of the Seller at the Seller's principal place of business. The contract when so approved shall supersede all previous communications either oral or written. No modification shall be binding upon the parties unless such modification shall be in writing duly executed by the Buyer and approved by an executive officer of Seller.

RISK OF LOSS

Unless specifically agreed in writing, all freight damages shall be paid by Buyer and risk of loss or damage to the goods passes to Buyer upon delivery of the goods by Seller to the carrier regardless of FOB designations. Seller reserves the right to select the means of transportation and routing and to ship loads of any quantity without charge to Seller. Seller retains a security interest in the goods or any replacements thereof regardless of the mode or attachment to realty or other property until final payment in cash has been made therefore. Any damage or loss of goods during shipment must be reported to the carrier and to Seller before the unloading of such goods. Any claims for such damage or loss must be presented to Seller within 90 days of delivery.

DELIVERY

Any delivery dates or schedules quoted by Seller shall be interpreted as estimates only and in no event shall such dates be construed as falling within the meaning of "time is of the essence".

NO SET OFF

Neither Buyer or any affiliated company, surety, or assignee, shall have the right to set off against any amounts which may become payable to Seller under this contract or otherwise, for amounts which the Seller may allegedly or in fact owe the Buyer or any affiliated company, surety or assignee, whether arising under this contract or otherwise.

PATENTS

Seller shall defend any suit or proceeding brought against the Buyer and shall pay any adverse judgement entered therein so far as such suit or proceeding is based upon a claim that the use of the goods or any part thereof manufactured by the Seller and furnished under this contract constitutes infringement of any U.S. patent, providing the Seller is promptly notified in writing and given authority, information and assistance for defense of same; and the Seller shall at its option, procure for the Buyer the right to continue to use said goods, or to modify it so that it becomes non-infringing, or to replace the same with non-infringing equipment or to remove said equipment and to refund the purchase price. The foregoing shall not be construed to include any agreement by the Seller to accept any liability whatsoever in respect to patents or inventions including more than the goods furnished hereunder, or in respect of patents for methods and processes to be carried out with the aid of said goods, except those which are inherent in the goods as furnished. The foregoing states the entire liability of Seller with regard to patent infringement.

If any goods shall be sold by the Seller to meet Buyer's specifications or requirements, Buyer agrees to defend, protect, indemnify and save harmless the Seller from any loss, damage, or injury arising out of the claim, suit or action at law or in equity for actual or alleged infringement of any patent of the U.S. or any foreign country because of such specifications or requirements in the sale of such goods and to defend such suit or actions which may be brought against the Seller.

CONFIDENTIAL INFORMATION

All drawings, designs, specifications and technical information prepared or submitted by Seller are confidential documents which are the sole property of Seller and shall not be used or turned over, directly or indirectly, in whole or in part to any person or persons not authorized by Seller in writing to inspect, possess or use same.

LIMITATION OF LIABILITY

IN NO EVENT SHALL THE TOTAL LIABILITY OF THE SELLER ARISING OUT OF THE PERFORMANCE OF BREACH OF THIS CONTRACT, WHETHER BASED ON CONTRACT, WARRANTY, NEGLIGENCE INDEMNITY, STRICT LIABILITY OR OTHERWISE, EXCEED THE PURCHASE PRICE OF THE UNIT OF EQUIPMENT UPON WHICH SUCH LIABILITY IS BASED.

THE SELLER SHALL IN NO EVENT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES ARISING OUT OF THIS CONTRACT OR ANY BREACH THEREOF, OR ANY DELAY IN DELIVERY OR DEFECT IN THE GOODS, PURCHASED HEREUNDER WHETHER BASED UPON LOST PROFITS OR REVENUE, WORK STOPPAGE, IMPAIRMENT OF OTHER GOODS, LOSS BY REASON OF SHUT-DOWN OR NON-OPERATION OR INCREASED EXPENSES OF OPERATION OR OTHERWISE, AND WHETHER OR NOT SUCH LOSS OR DAMAGE IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE.

Seller shall not be responsible for any loss or damage resulting from any delay in delivery or failure to perform, due to war, riots, civil insurrection or acts of the common enemy, fire, floods, strikes or other labor difficulties, acts of civil or military authority, including governmental laws, orders, priorities, regulations, acts of the purchaser, embargo, any shortage, wreckage or delay in transportation, inability to obtain necessary labor, materials or manufacturing facilities, faulty forgings or castings or other causes beyond the reasonable control of the Seller. In the event of delay in performance due to any such cause, the estimated date of delivery or time for completion will be adjusted to reflect such delay. The Buyer's acceptance of the goods shall constitute a waiver of all claims for delay.

TAXES

The price does not include any federal, state, or local property, license, privilege, sales, use, value added, excise, gross receipts, or other like taxes which may be now or hereafter applicable to, measured by, or imposed upon or with respect to this transaction, the goods, their sale, value, or any service performed in connection therewith. Any such taxes shall be added to the price quoted herein, unless exemption or resale certificate acceptable to the taxing authority, is furnished to Seller. If an exemption certificate previously accepted by seller is not recognized by the taxing authority involved, Buyer will immediately upon notice of the same pay to Seller the amount of the tax together with all penalties and interest thereon. Buyer shall also be liable to Seller for any expenses, including legal expenses, by reason of any delay or failure to pay as provided above.

WARRANTY

Seller warrants that the goods manufactured by it and delivered, or the services provided shall be free from significant defects in material and workmanship for a period of one year from the date of shipment of goods, or a period of 60 days from the completion of any service provided the goods or equipment are used with the service or pressure range for which they were manufactured. Seller shall, at its option, repair or replace any nonconformity by suitable repair or replacement FOB Seller's Plant, or by refunding the purchase price. Buyer shall bear all responsibility and expense incurred for removal, reinstallation, and shipping in connection with any part supplied under the foregoing warranty. Repair or replacement as set forth herein shall be the buyer's sole remedy, whether such claims are based on breach of warranty, negligence, or other theories.

This warranty shall apply only if the goods were installed in their "as shipped" condition and were installed, maintained, and operated in accordance with any specific recommendation of Seller. This warranty does not cover deterioration by corrosion or aging of parts, including stress corrosion. Repairs or alterations not authorized in writing by Seller shall void this warranty. Any material, equipment or part furnished by Seller but manufactured by others shall only carry whatever warranty the manufacturer thereof has conveyed to Seller and which can be passed on to the Buyer.

Compliance with the foregoing shall constitute fulfillment of all liabilities of Seller for any defect or nonconformity whether arising in contract, warranty, negligence, indemnity, strict liability or otherwise.

THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED. SELLER DISCLAIMS THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR PURPOSE.

DESIGN

Due to our policy of continuous product improvement, we reserve the right to change or modify design without incurring any obligation to furnish or install such changes or modifications on products previously or subsequently sold. Seller reserves the right to furnish substitutes for materials which cannot be reasonably obtained because of any restrictions, voluntary or compulsory, established by or in connection with any governmental authority.

ENGINEERING SERVICE

Upon request MILLIKEN VALVE COMPANY may provide engineering and/or technical information about its products and their uses; and if feasible may provide personnel to assist purchaser in effecting field installation and/or field service. Such information, service, or assistance so provided, whether with or without charge, shall be advisory only, and purchaser agrees to hold MILLIKEN VALVE COMPANY harmless from claims for loss from any cause resulting from such advisory or service activity.

QUOTATIONS AND PRICES

Quotations are for acceptance within 30 days or for the period of time specifically stated in the quotation. Prices are subject to change without notice. Prices are FOB factory subject to seller's usual freight allowances, if any. Orders requiring export packaging shall be subject to additional charges determined by Seller. \$25.00 minimum.

TERMS

Terms of payment are Net 30 days. Unpaid balance beyond 30 days shall bear interest at the rate of 2% per month or the lawful maximum.

MINIMUM BILLING

Minimum billing of \$200.00 (\$50.00 for parts) net will be charged per order or any partial shipment requested by customer. Change orders and/or "add on" supplements are subject to additional billings commensurate with the cost and will receive individual consideration insofar as minimum billing, freight allowance and discount are concerned.

RETURNS, CANCELLATIONS, AND CLAIMS

No material may be returned for credit or adjustment without permission and return tagging instructions-in writing-from our General Office.

On all material approved for return for credit; handling, restocking costs, if any, and costs to recondition for resale as new will be charged. Orders for items of special design, size, or material will not be accepted for credit nor will cancellation of such orders be accepted except upon written agreement to allow for payment for expenses incurred by MILLIKEN VALVE COMPANY covering special work which has been performed or material that has been ordered.

Claims for errors, corrections, shortages or deductions for erroneous charges must be made in writing within ten days after receipt of products and must refer to date and number of invoice. In making claims for shortages of products or any overcharges, the original paid freight bill must accompany each claim which in case of shortage should bear notification to the effect. Seller shall be obligated to substantially perform hereunder only and shall not be liable for any non-material or insubstantial breach or violation hereof and shall not be responsible or liable to Buyer for any claimed breach or violation of this Agreement unless notified in writing by the Buyer thereof within ten days after such breach of violation is known or could have been known to Buyer by reasonable inspection, but in no event shall Seller, except as specifically provide herein, be liable therefore, whether such breach is patent or latent for any notice of claim received more than one year after the date of shipment. Approval by Buyer's inspector of work in progress shall be conclusive and binding on Buyer with respect to such work.

ASSIGNMENT

Buyer shall not assign or transfer this contract without prior written consent of the Seller.

GOVERNING LAW

This contract shall be interpreted and enforced in accordance with the laws of the Commonwealth of Pennsylvania. Clerical and stenographical errors herein are subject to correction.

TECHNICAL SPECIFICATION

MULTI-PORT PLUG VALVE

3"-16"

Valves shall be of the three way non-lubricated type with an elastomer covering all seating surfaces of the tapered plug. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with ANSI B16.1 including facing, drilling and flange thickness. Valves shall be designed for a working pressure of 175 psi.

Valve bodies shall be of ASTM A-126 Class B cast iron. Plugs shall be of ASTM A-536 Grade 65-45-12 ductile iron in compliance with AWWA C-504 Section 2.2. The axial position of the plug shall be held in place by an adjustable gland. The valve shall operate without the need for lifting prior to turning the plug.

Valves shall be furnished with replaceable sleeve type bearings conforming to AWWA C-504-80, Section 3.6 and AWWA C-507-73, Section 8. Bearings shall be of sintered, oil impregnated type 316 stainless steel ASTM A743 Grade CF-8M. Valve shaft seals shall be of the "U" cup type in accordance with AWWA C504-80, Section 3.7. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Wrench operated valves shall be capable of being converted to worm gear or automated operation without removing the bonnet or plug from the valve. All wrench operated valves shall be equipped with a 2" square nut for use with removeable levers or extended "T" handles.

Worm gear operators, where required, shall be of heavy duty construction with the ductile iron quadrant supported on top and bottom by oil impregnated bronze bearings. The worm gear and shaft shall be manufactured of hardened steel and run on high efficiency roller bearings. Worm gear operators shall require single handwheel only.

Plug valves shall be Millcentric Series 604 as manufactured by Milliken Valve Company of Bethlehem, Pennsylvania.



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