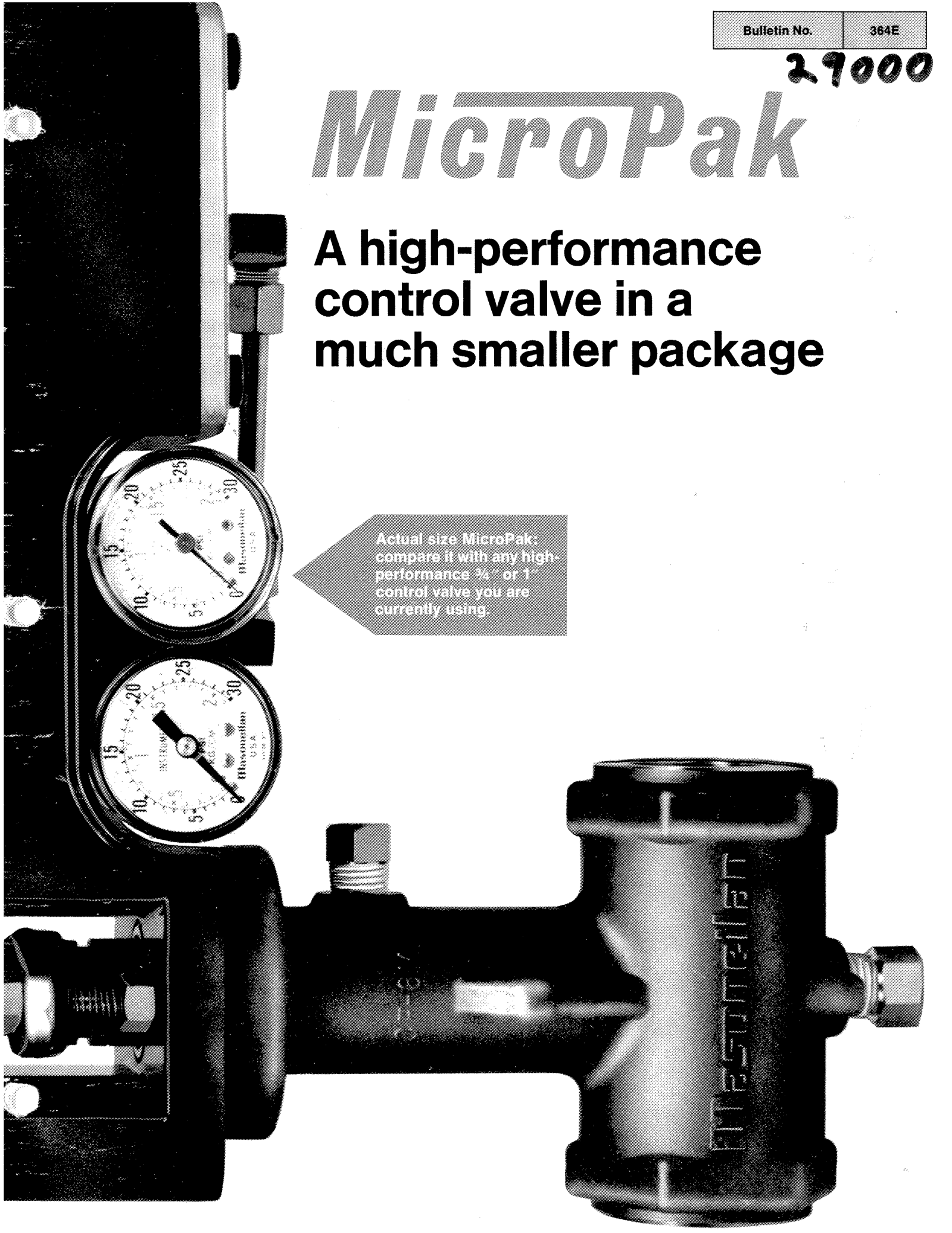


29000

MicroPak

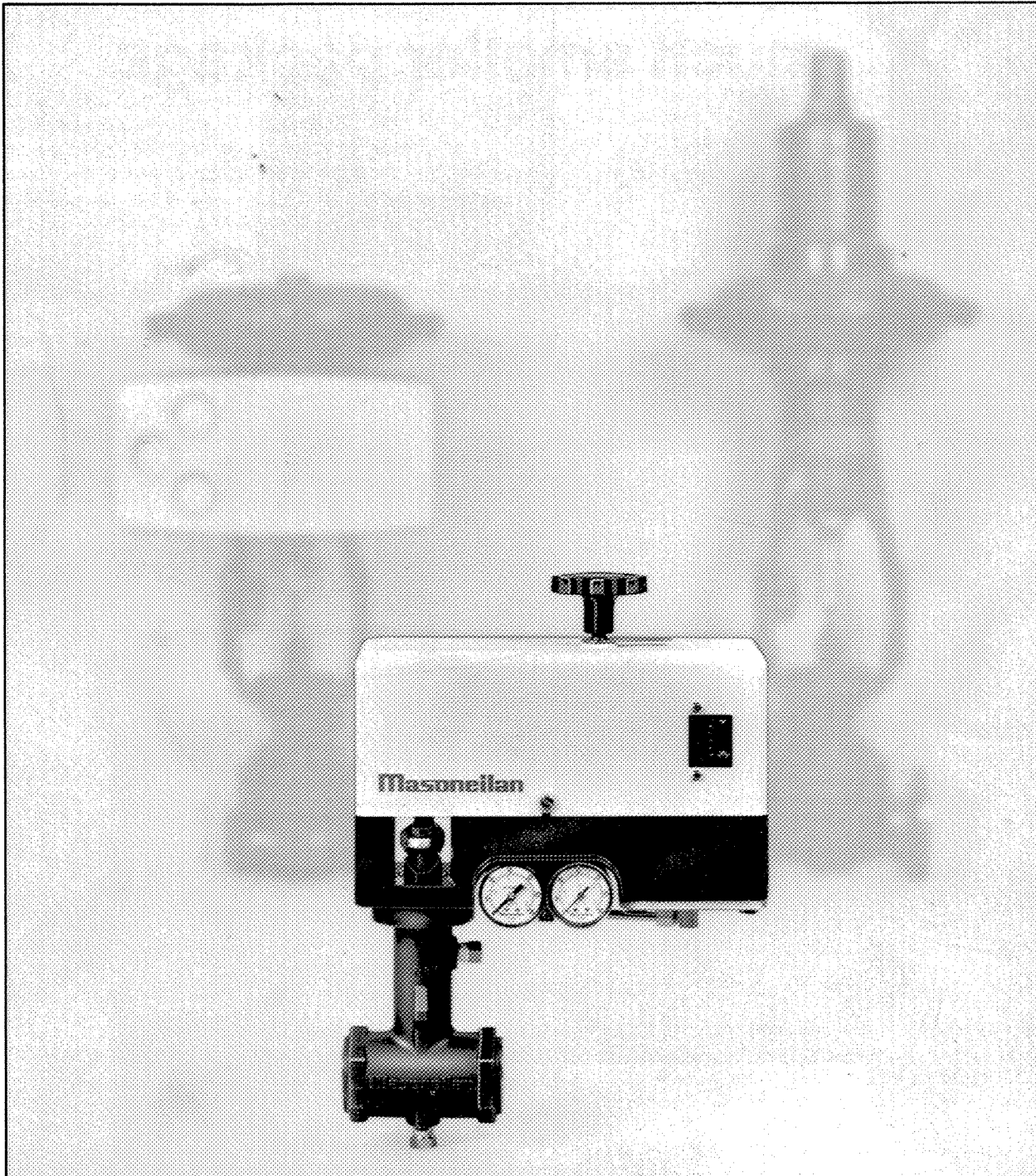
**A high-performance
control valve in a
much smaller package**



Actual size MicroPak:
compare it with any high-
performance 3/4" or 1"
control valve you are
currently using.

MicroPak

**offers performance to challenge
the rest in a small, complete package.**



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MicroPak is the first of its kind: a low-cost, universal, automatic control valve designed specifically for small flow applications. Its features and performance cover the broadest range of service conditions: C_v 's from .04 to 2.3; pressure drops to 3600 psi; body rated for 1500 lb ANSI; fluid temperatures from -320F to +650F. All covered by an integrated, compact, self-contained package — actuator, positioner and valve — measuring 4" by 11" by 15" and weighing 18 lbs.

By comparison, most control valves offered for low flow applications are traditional 3/4" or 1" valves with scaled down trim. They have limited ratings, limited allowable pressure drops, limited temperature ranges and high-cost optional materials and accessories. Yet their external dimensions, body and top-heavy actuator, are those of a full sized valve. And, frequently, several different types of low flow valves, having no interchangeability of parts or accessories, may be installed at the same site principally because no one valve can meet all the service conditions.

MicroPak changes the whole low flow picture.

It can be used for many applications involving control of water, steam, oil, chemical additives, corrosives and hydraulic fluids.

MicroPak's universal capability begins with its flangeless 1500 lb ANSI rated body which also has 1" NPT screwed ends. Accordingly, it will mount between 150, 300, 600, 900 or 1500 lb ANSI or metric raised face flanges, or accept 1" NPT threaded fittings. This service range is further extended by its standard materials: Type 316 stainless steel body; solid Stellite plug, and hardened Type 17-4 PH seat ring for long, rugged service life. The body's integral extended bonnet with standard Teflon-jacketed asbestos packing enables MicroPak to handle fluids with temperatures from -320F to +650F. MicroPak's low first cost stays low in the alloys in which it's also optionally available: Monel, Hastelloy-C and Alloy 20.

The MicroPak actuator is equally universal. A simple change in pin location makes it direct acting or reverse acting. Its integral, high gain positioner allows pressure drops to 1500 psi in the larger trim sizes; up to 3600 psi in the smaller trim sizes. Standard handwheel and locking level are built-in for manual override. Where desired, the instrument or supply air may be directly connected to operate the actuator's rolling diaphragm for on-off operation. For convenience in piping layout the

actuator may be mounted in four positions about the vertical center line of the body.

Due to its many built-in features and broad service range, the MicroPak is an ideal O.E.M. valve for packaged boiler and air conditioning systems and it's especially useful for pilot plants. To enhance its pilot plant application, a complete set of plugs and seat rings to provide C_v 's from .04 to 2.3 is available as an option. Line bolting is also available (see page 10).

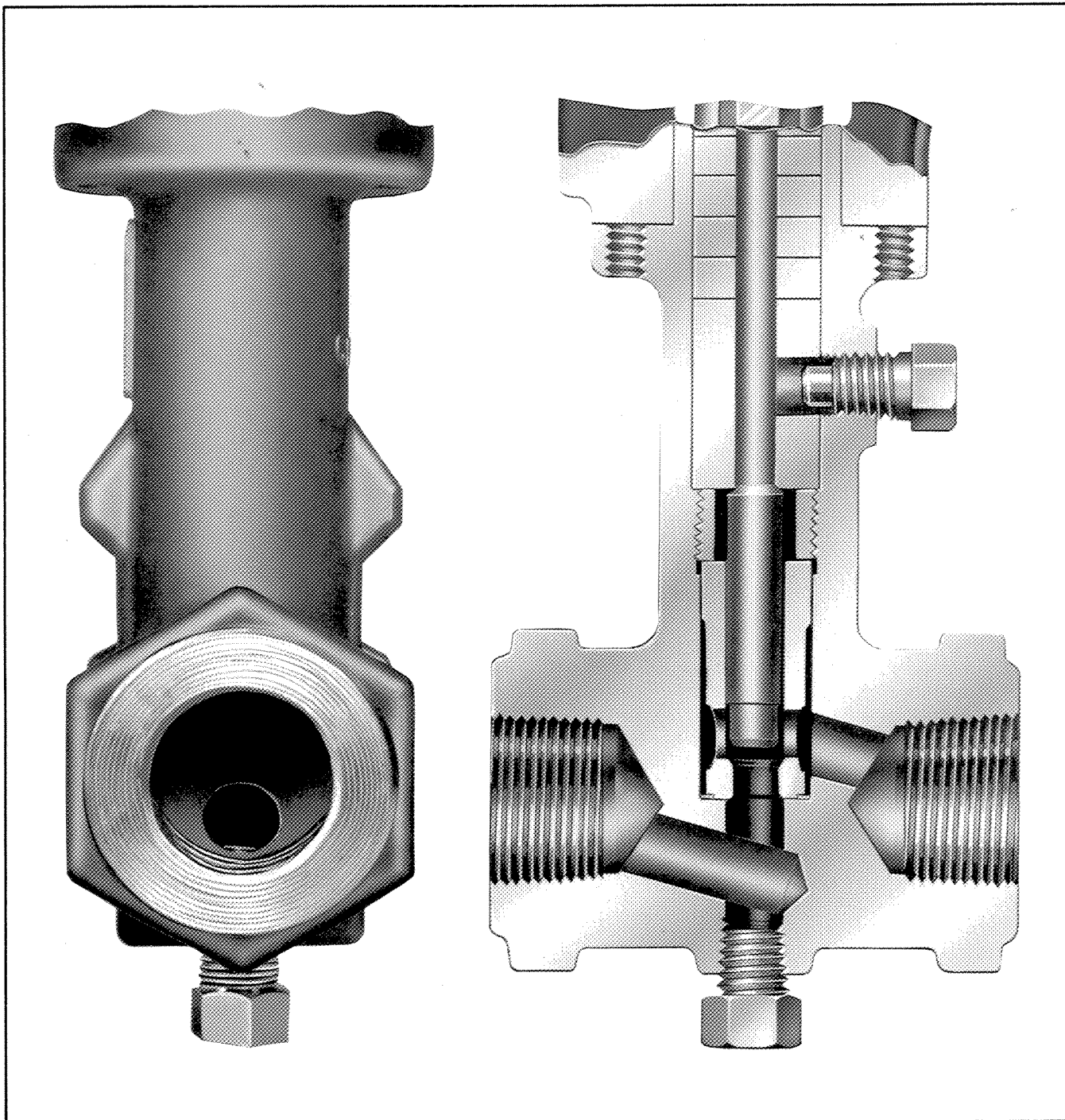
Let's Compare Standard Features of Your 3/4" or 1" Control Valve

Features	MicroPak Your Valve?
Choice of C_v 's from 0.04 to 2.3	✓
- 320F to + 650F temperature range due to integral bonnet	✓
High Allowable ΔP 's (to 3600 psi)	✓
Mounts between line flanges 150 lb to 1500 lb ANSI	✓
500:1 Rangeability	✓
Type 316 stainless steel flangeless body standard	✓
Solid Stellite plug Type 17-4 PH seat ring	✓
Single actuator is direct or reverse acting	✓
Integral high gain positioner	✓
Integral auxiliary handwheel with locking lever	✓
Complete valve weighs only 18 pounds	✓
Now Let's Compare Prices	*

*Call your local Masonellian Sales Office.

MicroPak

**body design combines performance
with extreme durability.**



MicroPak's unitized body and bonnet cover a wide range of flow processes with a durability unmatched in conventional small flow control valves.

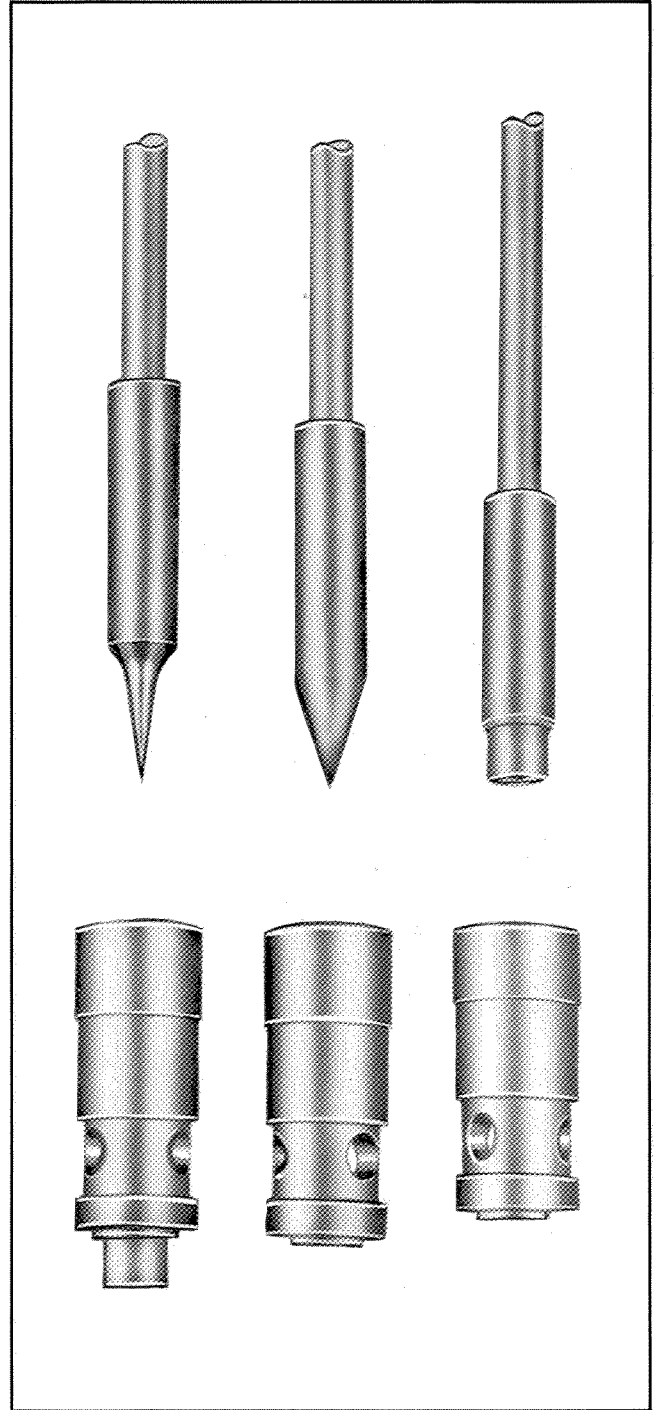
The MicroPak body is flangeless and has a standard rating of 1500 lb ANSI. It will mount between 150, 300, 600, 900 and 1500 lb ANSI and DIN (ND) 10-160 raised face flanges. The body is also threaded to accept 1" NPT screwed-end fittings. End faces are serrated per ANSI B16.5 to provide an extra tight seal.

Standard body material is Type 316 stainless steel. Monel, Hastelloy-C and Alloy 20 are available as options.

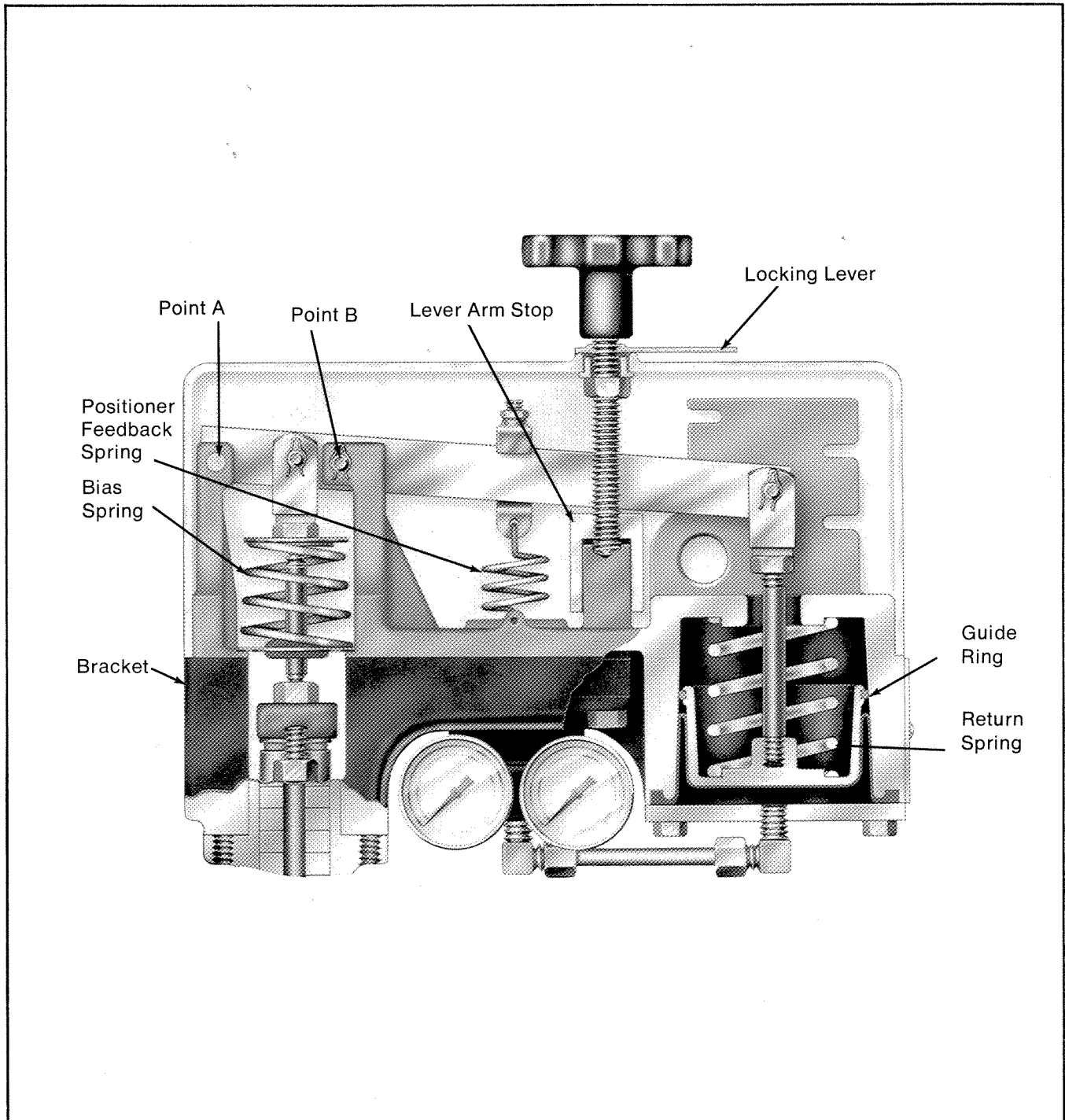
The ability of the MicroPak valve to handle a wide range of process fluid temperatures is due to the long integrally cast bonnet. This affords ample radiation surface to normalize the packing temperature. Therefore, with self-lubricating Teflon jacketed asbestos packing, the valve handles process fluid temperatures from -320F to +650F.

The MicroPak trim is as rugged as the body. Only three plugs and three seat rings are required to provide a choice of six C_v 's from 0.04 to 2.3. The plug is solid Stellite, furnace brazed to a Type 316 stainless steel stem. It is a top-guided, single-seat design. The Type 17-4 PH stainless steel seat ring also acts as the plug guide. Maximum allowable leakage is 0.01% of rated C_v (with 50 psi air to atmosphere). This holds throughout the temperature range of the valve. Trim is easily removed through the bonnet. A safety plug is screwed into the bonnet to prevent the plug from being pushed out when the actuator is removed and the valve is still pressurized. A threaded retainer accepts both inch and MM Allen wrench sizes and holds the seat ring in place. A drain plug permits purging and access for trim removal.

The unitized body and bonnet of the MicroPak valve does not require closures and the associated gaskets, studs and nuts. This design eliminates sources of body leakage, makes installation simple.



A simple, powerful actuator provides excellent positioning accuracy; allows very high pressure drops.



The MicroPak is equipped with a complete, powerful, precise positioning actuator in a 4" x 10" x 9" package. It mounts in 4 positions around the vertical center line of the valve body — (see page 9). This one actuator handles all C_v 's and all pressure drops listed. With a simple pin relocation, it is set either for direct or reverse action. It has everything; a powerful rolling diaphragm actuator, spool type positioner and manual handwheel with locking lever.

The actuator is contained in a one-piece precision cast aluminum bracket. The cover is of extremely strong plastic. It is immune to corrosion by chemicals and is ultra-violet light-resistant.

The actuator itself is of a rolling diaphragm type operating through a .7" or a .9" stroke. It is connected to a lever arm which provides a force amplification. Changing action from direct to reverse or vice versa is accomplished by relocating the position of the pivot pin from Point A to Point B.

The positioner feedback spring is connected to an adjustable spring clamp on the lever arm.

The rolling diaphragm assembly is held in place by a guide ring which centers the piston. The ability of the piston assembly to float within the cylinder enables it to be directly linked to the lever arm which is connected to the plug stem. The actuator return spring provides adequate bias open operation on air-to-close action and sufficient seating force even up to maximum pressure drop on air to open operation.

The auxiliary manual handwheel is mounted in the cover. The thrust of the handwheel load is absorbed in the bracket. No load is transmitted to the cover. The lever arm stop is threaded and is prevented from turning by a boss on the bracket. A locking lever is provided. The handwheel can serve as a limit stop in the "fail safe" direction.

Backlash is eliminated in the MicroPak with a stainless steel bias spring. An elastomer grommet seals off the actuator internal parts from dirt.

A special, integrally-cast pad on the actuator bracket permits mounting one or two intrinsically safe limit switches inside the cover for protection.

A colored stroke indicator gives instant indication of valve position.

Drain holes in the casting prevent moisture buildup.

The integral positioner provides high gain with low air consumption

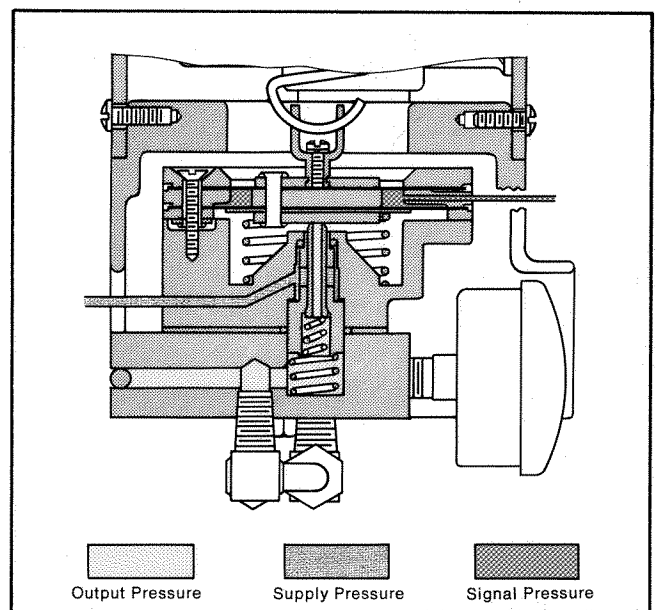
The integrally mounted MicroPak positioner provides excellent positioning accuracy. The simple feedback mechanism is directly and internally connected to the lever arm. External, exposed linkage has been eliminated giving the positioner positive, accurate feedback.

Internal parts are protected from tampering and outside dirt, an important feature for plants with dirty environments. Also, the small bleed-off air from the positioner exhausts through the actuator case maintaining a continuous clean air purge of internal parts.

The spool-and-sleeve pilot valve achieves a high degree of response with low air consumption. Yet maximum air capacity of the pilot is high for fast stroking speeds. The valve will stroke in less than one second.

Action is direct, i.e. an increase in instrument signal increases output pressure to the actuator. It operates on a 3-15, 6-30 or 3-27 psi signal. Also available are 3-9 and 9-15 psi split range.

The simple feedback adjustment is simply a zero adjustment and is located on the lever arm. Stainless steel gauges are used as standard and are protected by a cover shield integrally cast into the actuator bracket. All external tubing is stainless steel.



specifications and performance data

general data

flow characteristic: linear
rangeability: 500:1
flow direction: flow to open
standard seat leakage: 0.01% of maximum C_v at 50 psi air to atmosphere

body

type: globe style with integral bonnet; bar stock body in non-castable materials
size: 1"
materials: Type 316 stainless steel standard; Monel, Hastelloy-C and Alloy 20 options (see Table of Materials, Page 10)
body rating: 1500 lb
connections: flangeless, clamps between flanges of the following ratings: 150 lb, 300 lb, 600 lb, 900 lb and 1500 lb ANSI; DIN (ND) 10 through 160. End connections are also screwed 1" NPT. (Screwed connections not available in bar stock body.) Line flange bolts optional.

plug and stem

type: top entry, cage-guided plug
material: solid Stellite #6 Plug, 316 St. St. Stem

seat ring

type: one-piece cage and seat
material: Type 17-4 PH stainless steel

packing box

type: bolted
packing: split-ring Teflon-jacketed asbestos

actuator

type: spring-opposed rolling diaphragm with lever
material: die-cast aluminum-anodized
action: air-to-open (fail closed) and air-to-close (fail open)
supply air: 25-30 psi (air-to-open action)
 30-35 psi (air-to-close action)
rated operating pressure: 60 psi
air connection: 1/4" NPT

positioner assembly

(always used for throttling operation)

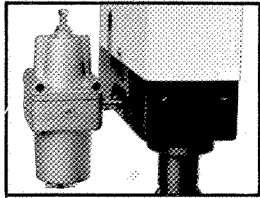
type: pneumatic, force balance, spool pilot
action: increasing instrument signal increases output air
instrument signal: 3-15, 6-30, 3-27 psi and 3-9 or 9-15 psi split range
connections: 1/4" NPT instrument and supply
average air consumption: 9 SCFH
maximum air output: 260 SCFH
supply pressure effect: 0.05% stroke change per psi supply change
open loop gain: 70:1
linearity: $\pm 0.5\%$
sensitivity: 0.1%
repeatability: 0.1%
full stroke time: less than one second
weight
complete valve: 18 lbs
shipping weight: 20 lbs

flow and pressure drop data

Flow Coefficient (C_v)	Critical Flow Factor (C_f)	Maximum Allowable Pressure Drop (psi)
2.3	.93	1500
1.2	.84	1500
0.60	.74	3600
0.25	.95	3600
0.10	.85	3600
0.04	.85	3600

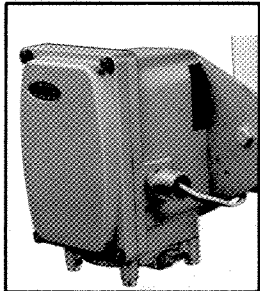
temperature limitations

Material	Low	High
Type 316 stainless steel	-320F	+650F
Monel	-320F	+500F
Hastelloy-C	-320F	+500F
Alloy 20	-50F	+500F



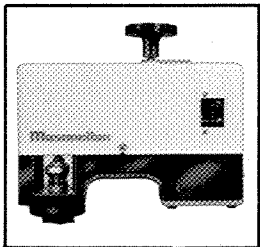
77-4 Airset

The Model 77-4 is an accurate, high capacity, reducing-relief type valve for instrument supply service. Refer to Catalog 80E.



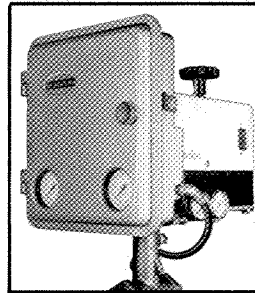
8005 Electropneumatic transducer

The Masoneilan Model 8005 transducer is a force-balance device that provides an accurate means of converting a low-power dc electrical control signal into a proportional, pneumatic, output signal. Refer to Bulletin 322E.



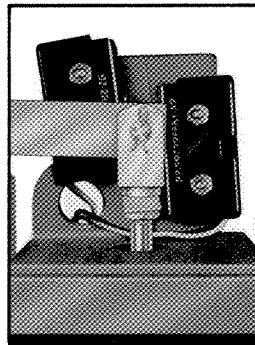
On-off option

For on-off applications the MicroPak valve is available without a positioner. Three-way (two-position) solenoid valves are available for remote or valve-mounted control of air pressure.



Controllers

2700 Series pressure and 3700 Series temperature controllers are simple, highly reliable pneumatic non-indicating instruments, which offer a choice of proportional, proportional-reset, or differential gap control. Refer to Bulletin 222E.



Limit switches

Limit switches are provided as an option to electrically indicate one or two predetermined positions in the MicroPak valve. They may be used to actuate solenoids, relays, audible alarms or signal warning lights. They are mounted on a pad integrally cast in the actuator bracket and are located inside the case for protection.

29000 Series MicroPak Valve Numbering System

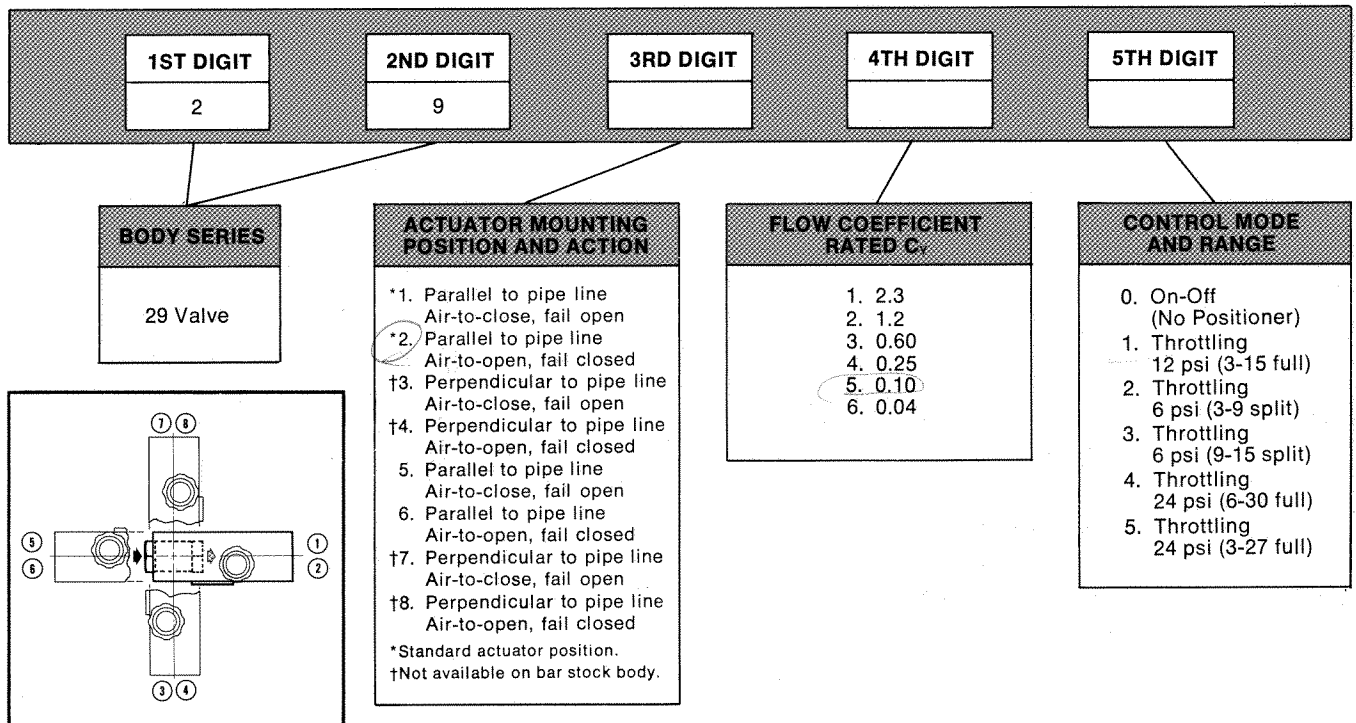
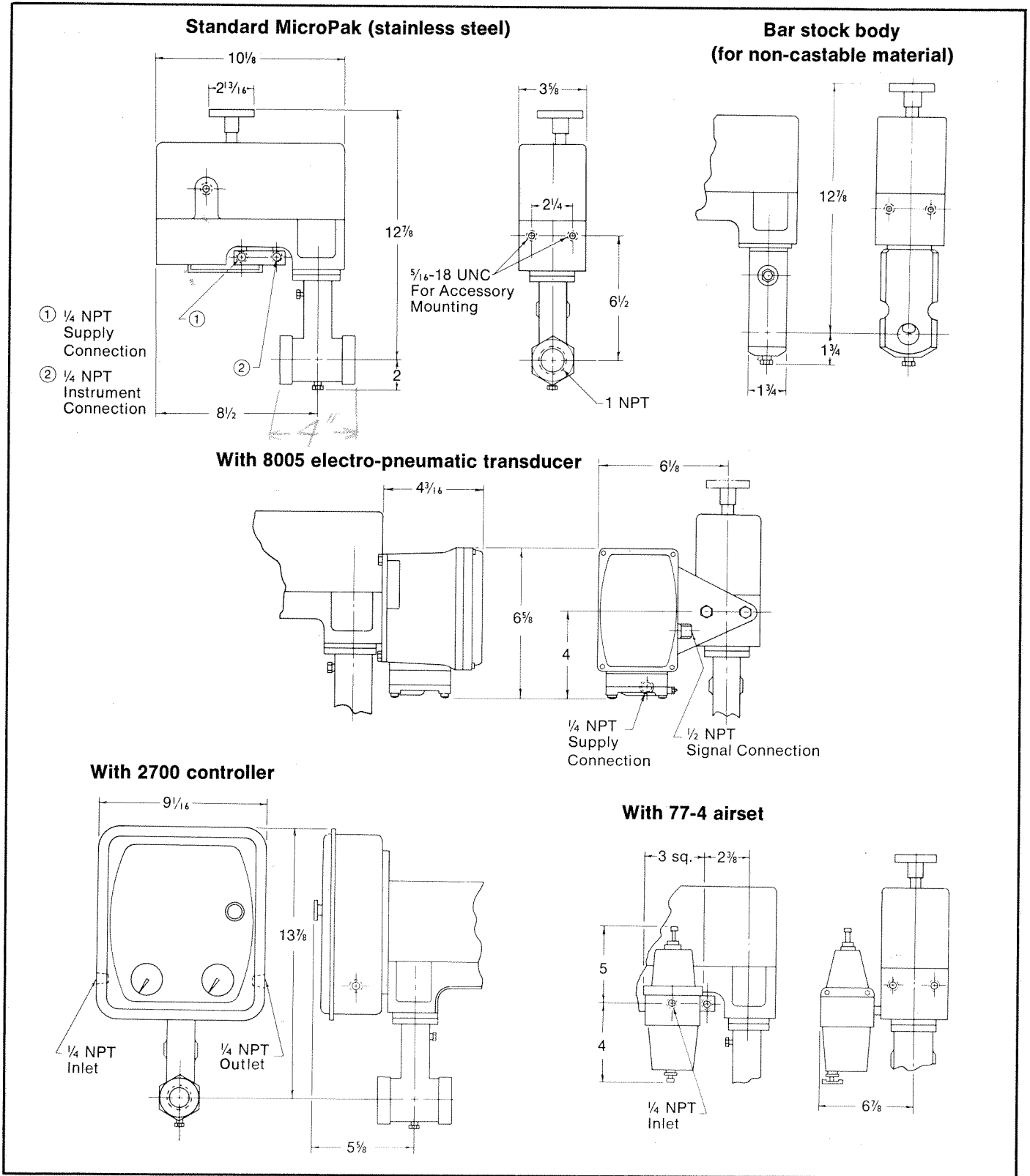
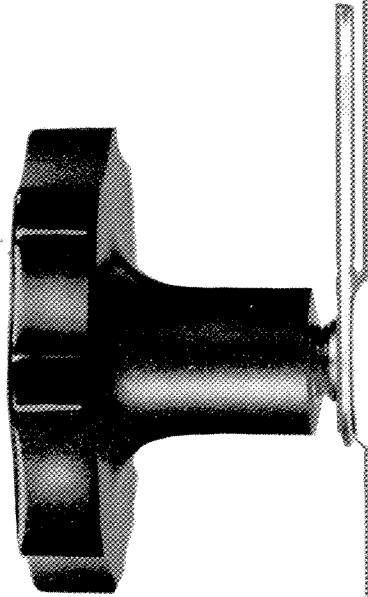


Table of Materials

Valve Part	Body Material			
	Type 316 St. St.	Monel	Hastelloy-C	Alloy-20
Pipe Plug	ASTM A276 (Type 316 St. St.)	ASTM B164 CI A (Monel 400)	ASTM B336 (Hastelloy-C)	ASTM B473 (Alloy-20)
Seat Ring Gasket	Asbestos	Glass Filled Teflon	Glass Filled Teflon	Glass Filled Teflon
Seat Ring	ASTM A564 Gr 630 Condition H900 (Type 17-4 PH St. St.)	Monel K500	ASTM B336 (Hastelloy-C)	ASTM B473 (Alloy-20)
Seat Ring Retainer	ASTM A564 Gr 630 Condition H1075 (Type 17-4 PH St. St.)	Monel K500	ASTM B336 (Hastelloy-C)	ASTM B473 (Alloy-20)
Packing Spacer	ASTM A276 (Type 316 St. St.)	ASTM B164 CI A (Monel 400)	ASTM B336 (Hastelloy-C)	ASTM B473 (Alloy-20)
Packing	Crane No. 285 (Teflon Jacketed Asbestos)	—————>	—————>	—————>
Packing Flange Studs	ASTM A193 Gr B8 (Type 304 St. St.)	—————>	—————>	—————>
Packing Flange Nuts	ASTM A194 Gr 8 (Type 304 St. St.)	—————>	—————>	—————>
Packing Follower	ASTM A582 (Type 303 St. St.)	ASTM B164 CI A (Monel 400)	ASTM B336 (Hastelloy-C)	ASTM B473 (Alloy-20)
Packing Flange	ASTM A235 CI C (Cad Plated Carbon Steel)	ASTM A182 (Type 304 St. St.)	—————>	—————>
Safety Pin	ASTM A276 (Type 316 St. St.)	ASTM B164 CI A (Monel 400)	ASTM B336 (Hastelloy-C)	ASTM B473 (Alloy-20)
Valve Plug	No. 6 Stellite (with Type 316 St. St. Stem)	Monel K500	ASTM B336 (Hastelloy-C)	ASTM B473 (Alloy-20)
Valve Body	ASTM A182 Gr F 316 (Type 316 St. St.)	ASTM A269 Gr M-35 (Monel 410)	ASTM A494 Gr CW-12M-1 (Hastelloy-C)	ASTM A351 Gr CN-7M (Alloy-20)
Optional Steel Line Flange Studs	ASTM A193 Gr B7 (Cad. Plated 4140 Alloy Steel)	—————>	—————>	—————>
Optional Steel Line Flange Nuts	ASTM A194 Gr 2H (Cad. Plated Carbon Steel)	—————>	—————>	—————>
Optional Stainless Steel Line Flange Studs	ASTM A193 Gr B8 (Type 304 St. St.)	—————>	—————>	—————>
Optional Stainless Steel Line Flange Nuts	ASTM A194 Gr 8 (Type 304 St. St.)	—————>	—————>	—————>

dimensions and installation data with and without accessories





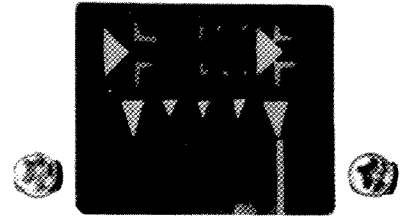
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