

COMBINATION REGULATORS

TYPE ED & ED2 PRESSURE REGULATOR



TYPE ED SERIES PRESSURE REGULATOR

CAST IRON or STEEL
PRESSURES to 600 PSIG at 750°F

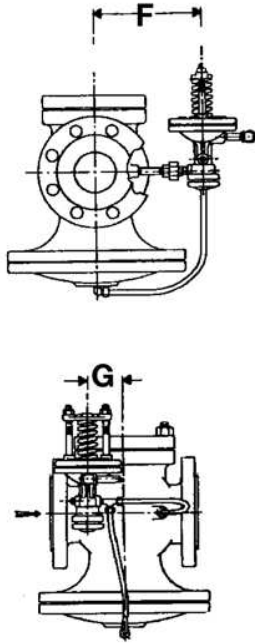
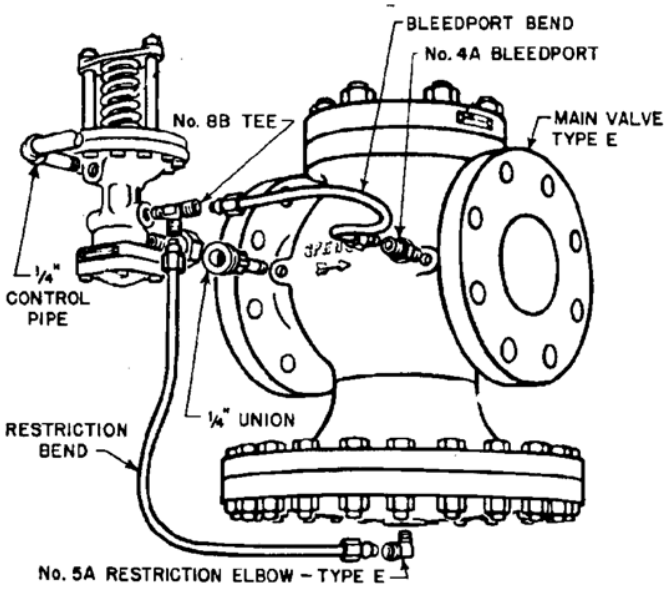
APPLICATION DATA

- Pressure Regulating for Steam Distribution
- Single Point or Multiple use Applications
- Pressure Control for Steam Plants
- District Heating Systems
- Single Stage Reductions
- Two Stage Reductions
- Parallel Reduction

TYPE ED PRESSURE REGULATOR

VALVE INFO
PAGE 26

PILOT INFO
PAGE 46



DIMENSIONS
inches (mm)

SIZE	F	G
3/8 (10)	5 3/8 (136)	1 1/4 (32)
1/2 (15)	5 3/8 (136)	1 1/4 (32)
3/4 (20)	5 3/8 (136)	1 3/8 (35)
1 (25)	5 3/4 (146)	1 1/2 (38)
1 1/4 (32)	6 (152)	1 7/8 (48)
1 1/2 (40)	6 1/4 (159)	2 (51)
2 (60)	6 5/8 (168)	2 1/8 (54)
2 1/2 (65)	6 3/4 (171)	2 3/8 (60)
3 (80)	7 1/4 (184)	2 3/4 (70)
4 (100)	8 (203)	3 1/2 (89)
5 (125)	9 (229)	3 1/2 (89)
6 (150)	9 7/8 (251)	4 (102)
8 (200)	10 1/2 (267)	6 1/4 (159)
10 (250)	12 1/2 (318)	6 (152)
12 (300)	14 (356)	8 1/2 (216)

Valve is tapped so that Pilot may be mounted on either side.



TYPE E2D SERIES PRESSURE REGULATOR

CAST IRON
PRESSURES to 15 PSIG max.

APPLICATION DATA

- Pressure Regulating for Steam Distribution
- Single Point or Multiple use Applications
- Single Stage Reduction
- Parallel Reduction
- Low Pressure Drop to Operate Valve
- Instantaneous Hot Water Heaters with low supply pressures (with the addition of a T14 Pilot)



TYPE E2D
PRESSURE REGULATOR

TYPE E2D PRESSURE REGULATOR

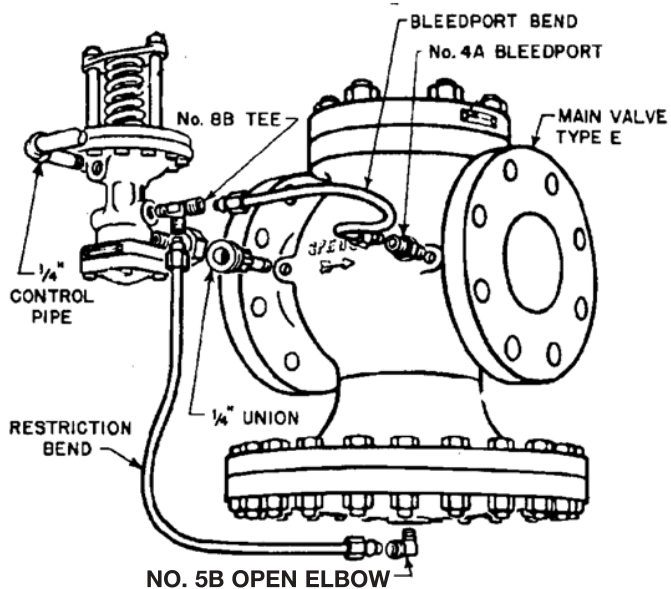
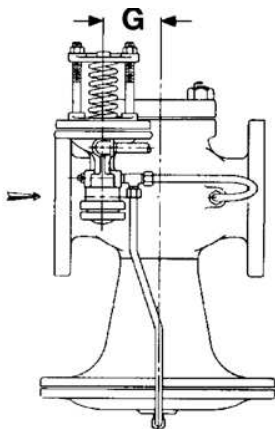
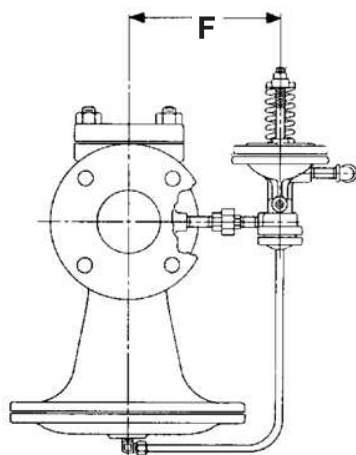
VALVE INFO
PAGE 28

PILOT INFO
PAGE 46

DIMENSIONS

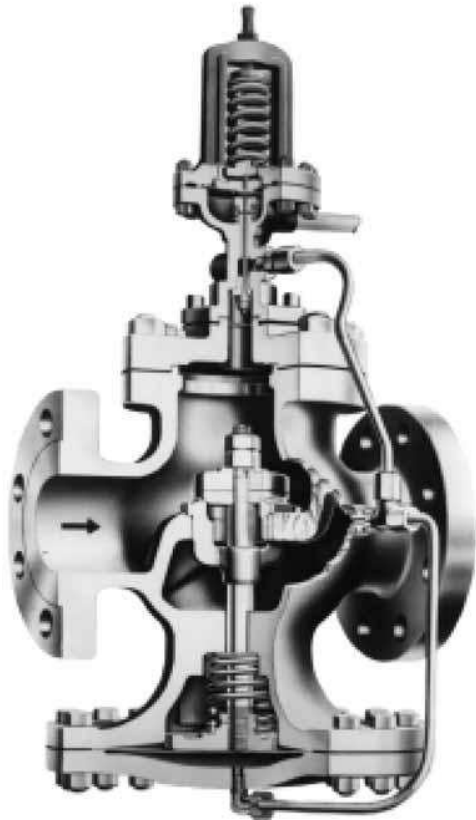
inches (mm)

SIZE	F	G
3/4 (20)	5 5/8 (143)	1 3/8 (35)
1 (25)	5 3/4 (146)	1 1/2 (38)
1 1/4 (32)	6 (152)	1 7/8 (48)
1 1/2 (40)	6 1/4 (159)	2 (51)
2 (50)	6 5/8 (168)	2 1/8 (54)
2 1/2 (65)	6 3/4 (171)	2 3/8 (60)
3 (80)	7 1/4 (184)	2 3/4 (70)
4 (100)	7 3/8 (187)	3 1/2 (89)
5 (125)	8 1/8 (206)	3 1/2 (89)
6 (150)	8 1/2 (216)	4 (102)
8 (200)	9 3/8 (238)	6 1/4 (159)
10 (250)	11 (279)	6 (152)



Valve is tapped so that Pilot may be mounted on either side.

TYPE ED(2) INTEGRAL PRESSURE REGULATOR



TYPE ED & ED2 INTEGRAL MOUNT PRESSURE REGULATOR

CAST IRON or STEEL
for PRESSURES to 600 PSIG at 750°F

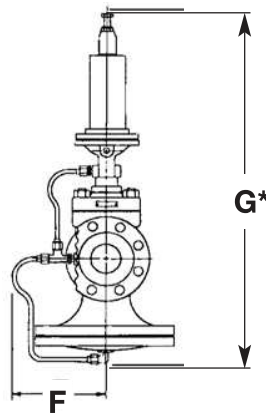
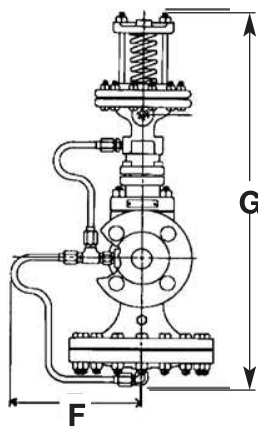
APPLICATION DATA

- Pressure Regulation for Steam Distribution where space is limited

TYPE ED INTEGRAL MOUNT PRESSURE REGULATOR

VALVE INFO
PAGE 26

PILOT INFO
PAGE 46



DIMENSIONS inches (mm)

SIZE	F	G*
3/8 (10)	5 1/4 (133)	15 3/4 (400)
1/2 (15)	5 1/4 (133)	15 3/4 (400)
3/4 (20)	5 3/8 (136)	17 (432)
1 (25)	5 1/2 (140)	18 1/2 (470)
1 1/4 (32)	5 3/4 (146)	18 1/2 (470)
1 1/2 (40)	6 (152)	19 1/2 (495)
2 (50)	6 1/2 (165)	20 5/8 (524)
2 1/2 (65)	7 (178)	21 3/4 (552)
3 (80)	7 3/8 (187)	23 1/2 (597)
4 (100)	8 7/8 (225)	27 1/4 (692)
5 (125)	10 (254)	28 5/8 (727)
6 (150)	11 3/8 (289)	31 1/2 (800)
8 (200)	12 3/4 (324)	35 3/8 (899)
10 (250)	15 1/2 (394)	43 3/4 (1111)
12 (300)	18 (457)	47 3/4 (1213)

* For D2 Pilot, add 5 1/4" (133) to this dimension.



TYPE EA SERIES PRESSURE REGULATOR

CAST IRON or STEEL
for PRESSURES to 600 PSIG at 750°F

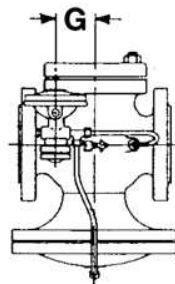
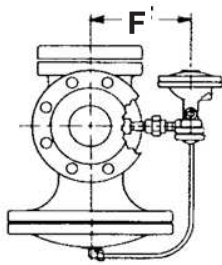
APPLICATION DATA

- Pressure Regulating for Steam Distribution
- Single Point or Multiple use Applications
- Pressure Control for Steam Plants
- District Heating Systems
- Single Stage Reductions
- Two Stage Reductions
- Parallel Reduction
- Control from Remote Location
- Temperature Regulating (with addition of T60 Series Pneumatic Temperature Pilot)

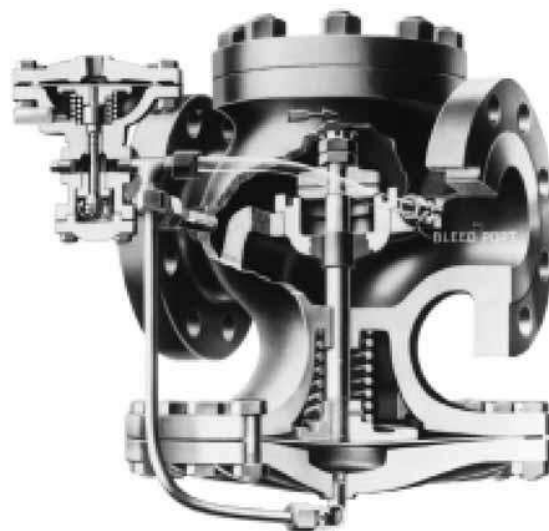
DIMENSIONS

inches (mm)

SIZE	F	G
3/8 (10)	5 3/8 (136)	1 1/4 (32)
1/2 (15)	5 3/8 (136)	1 1/4 (32)
3/4 (20)	5 5/8 (143)	1 3/8 (35)
1 (25)	5 3/4 (146)	1 1/2 (38)
1 1/4 (32)	6 (152)	1 7/8 (48)
1 1/2 (40)	6 1/4 (159)	2 (51)
2 (50)	6 5/8 (168)	2 1/8 (54)
2 1/2 (65)	6 3/4 (171)	2 3/8 (60)
3 (80)	7 1/4 (184)	2 3/4 (70)
4 (100)	8 (203)	3 1/2 (89)
5 (125)	9 (229)	3 1/2 (89)
6 (150)	9 7/8 (251)	4 (102)
8 (200)	10 1/2 (267)	6 1/4 (159)
10 (250)	12 1/2 (318)	6 (152)
12 (300)	14 (356)	8 1/2 (216)



Valve is tapped so that Pilot may be mounted on either side.

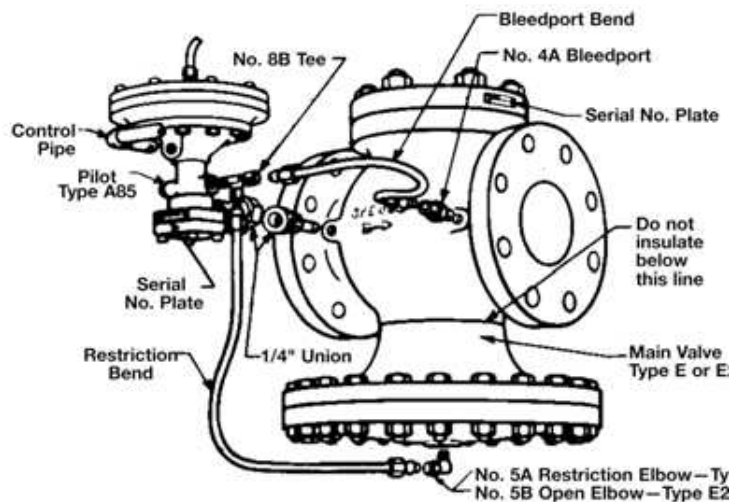


TYPE EA Series
PRESSURE REGULATOR

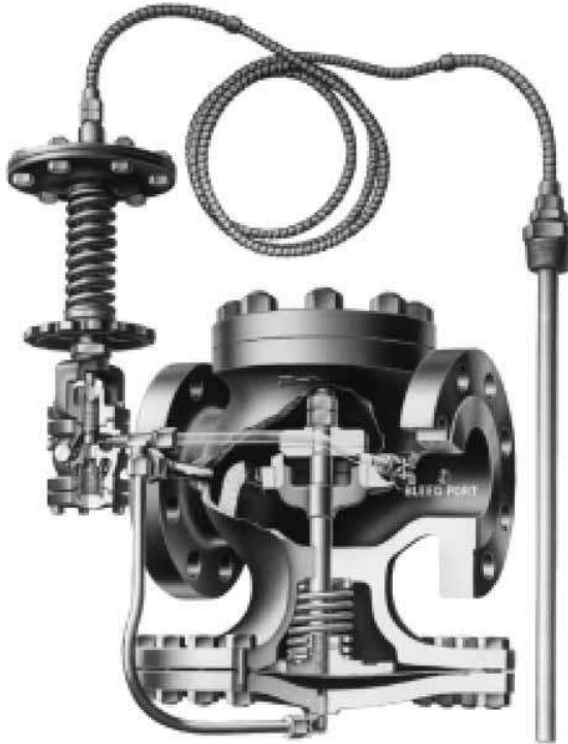
TYPE EA SERIES
PRESSURE REGULATOR

VALVE INFO
PAGE 26

PILOT INFO
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TYPE ET14
TEMP. REGULATOR



TYPE ET14 TEMPERATURE REGULATOR

CAST IRON or STEEL
CONTROLS 20 to 500°F

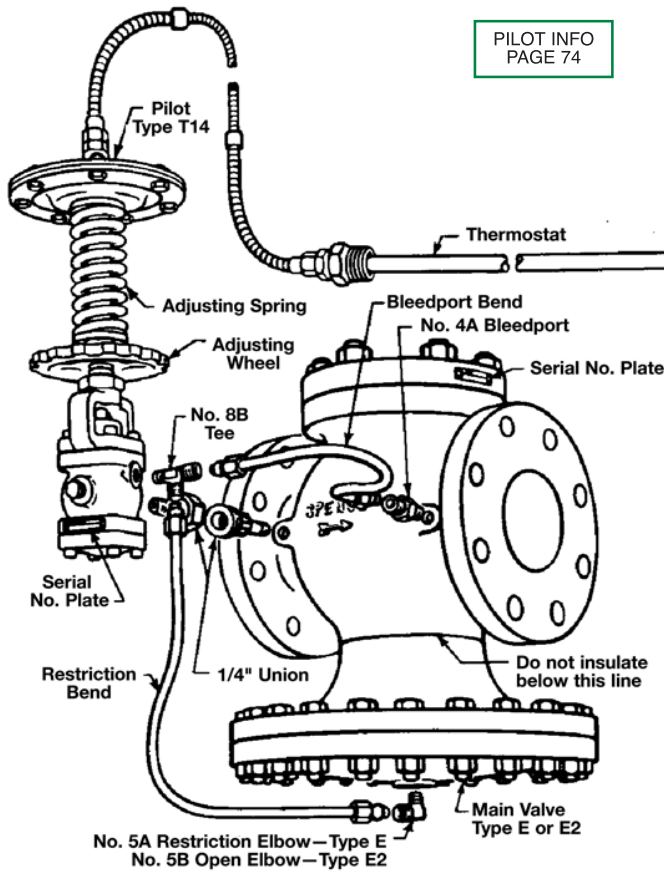
APPLICATION DATA

- Temperature Regulation for Batch Process
- Storage Heaters (Water, Fuel Oil or Chemical)
- Air Heating

TYPE ET14 TEMPERATURE REGULATOR

VALVE INFO
PAGE 26

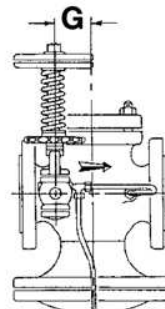
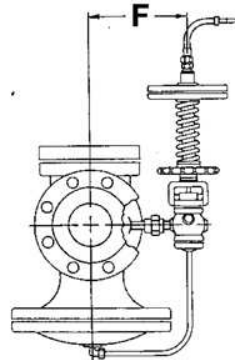
PILOT INFO
PAGE 74



DIMENSIONS

inches (mm)

SIZE	F	G
3/8 (10)	5 3/8 (136)	1 1/4 (32)
1/2 (15)	5 3/8 (136)	1 1/4 (32)
3/4 (20)	5 5/8 (143)	1 3/8 (35)
1 (25)	5 3/4 (146)	1 1/2 (38)
1 1/4 (32)	6 (152)	1 7/8 (48)
1 1/2 (40)	6 1/4 (159)	2 (51)
2 (50)	6 5/8 (168)	2 1/8 (54)
2 1/2 (65)	6 3/4 (171)	2 3/8 (60)
3 (80)	7 1/4 (184)	2 3/4 (70)
4 (100)	8 (203)	3 1/2 (89)
5 (125)	9 (229)	3 1/2 (89)
6 (150)	9 7/8 (251)	4 (102)
8 (200)	10 1/2 (267)	6 1/4 (159)
10 (250)	12 1/2 (318)	6 (152)
12 (300)	14 (356)	8 1/2 (216)



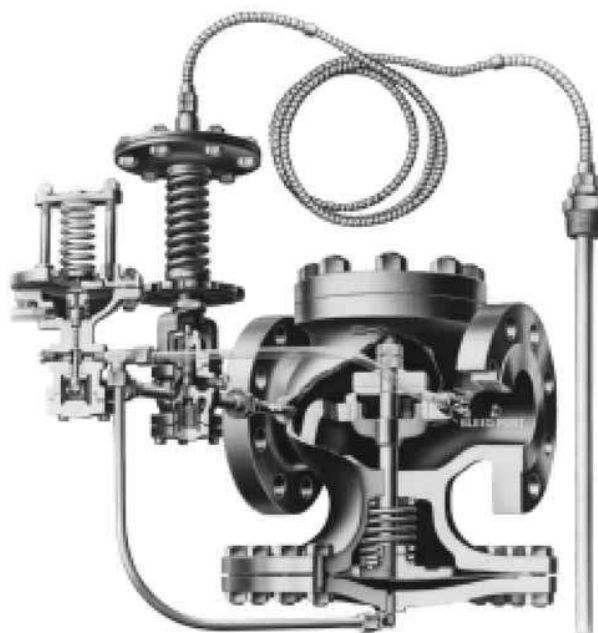
Valve is tapped so that Pilot may be mounted on either side.

TYPE ET14D PRESSURE LIMITING TEMPERATURE REGULATOR

CAST IRON or STEEL
CONTROLS 20 to 500°F

APPLICATION DATA

- Temperature & Pressure Regulation for large volume Heat Exchangers
- Storage Heaters
- Jacketed Kettles
- Vats

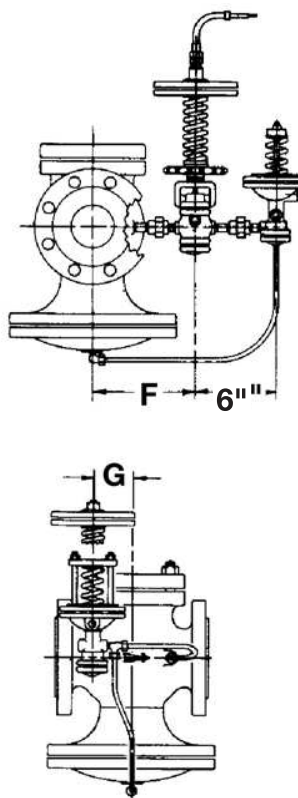


TYPE ET14D
TEMP. REGULATOR

TYPE ET14D TEMPERATURE
& PRESSURE REGULATOR

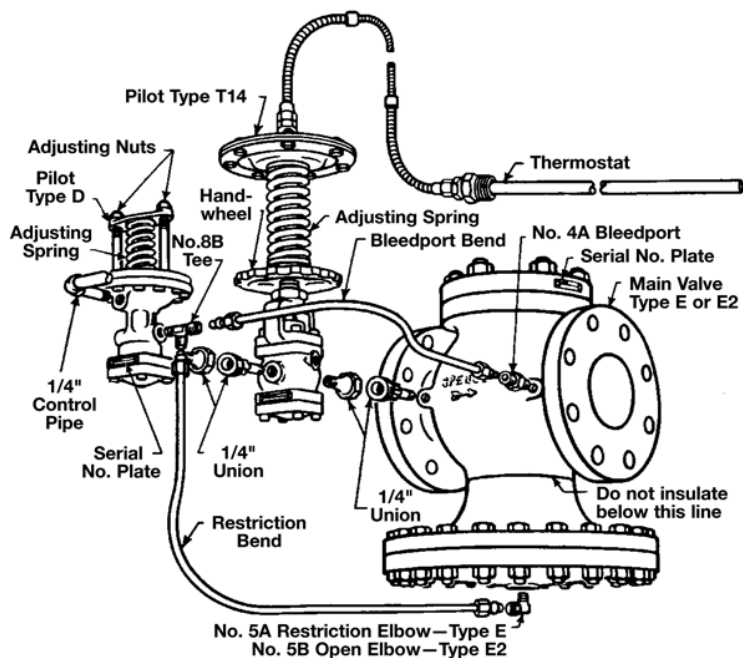
DIMENSIONS inches (mm)

SIZE	F	G
3/8 (10)	5 3/8 (136)	1 1/4 (32)
1/2 (15)	5 3/8 (136)	1 1/4 (32)
3/4 (20)	5 5/8 (143)	1 3/8 (35)
1 (25)	5 3/4 (146)	1 1/2 (38)
1 1/4 (32)	6 (152)	1 7/8 (48)
1 1/2 (40)	6 1/4 (159)	2 (51)
2 (50)	6 5/8 (168)	2 1/8 (54)
2 1/2 (65)	6 3/4 (171)	2 3/8 (60)
3 (80)	7 1/4 (184)	2 3/4 (70)
4 (100)	8 (203)	3 1/2 (89)
5 (125)	9 (229)	3 1/2 (89)
6 (150)	9 7/8 (251)	4 (102)
8 (200)	10 1/2 (267)	6 1/4 (159)
10 (250)	12 1/2 (318)	6 (152)
12 (300)	14 (356)	8 1/2 (216)



Valve is tapped so that Pilot may be mounted on either side.

- VALVE INFO
PAGE 26
- D PILOT INFO
PAGE 46
- T14 PILOT INFO
PAGE 74



TYPE E(2)T124/134
TEMP. & PRESS. REGULATOR



TYPE ET124/ET134 & E2T134

TEMPERATURE & PRESSURE REGULATOR

CAST IRON or STEEL

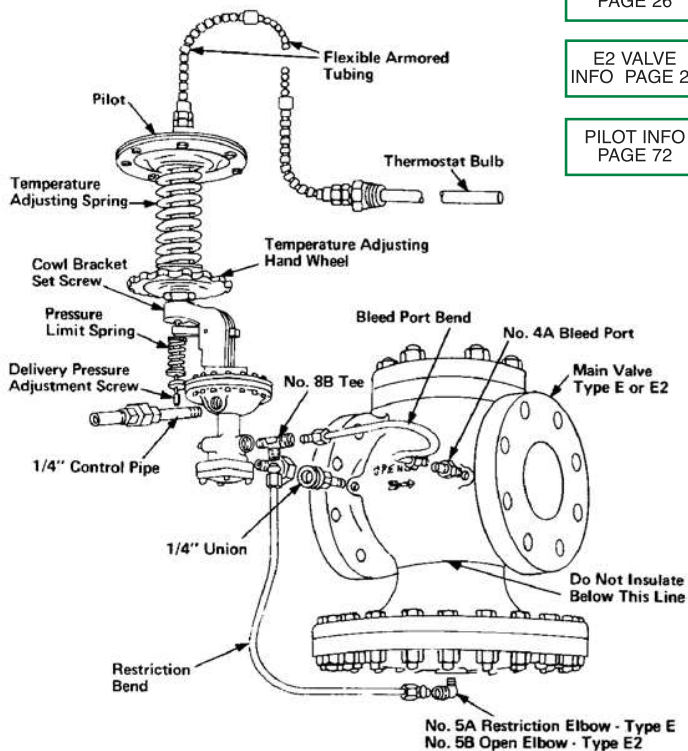
APPLICATION DATA

- Instantaneous Heaters
- Process Heaters
- Jacketed Kettles
- Vats
- Storage Heaters
- Driers
- Oil Heaters
- Ovens
- Batch Heating

MODELS

- ET124 for heater operating pressures between 20 and 125 psi.
- ET134 for heater operating pressures up to 20 psi.
- E2T134 for heater operating pressures up to 15 psi.

TYPE ET124 TEMPERATURE & PRESSURE REGULATOR



E VALVE INFO
PAGE 26

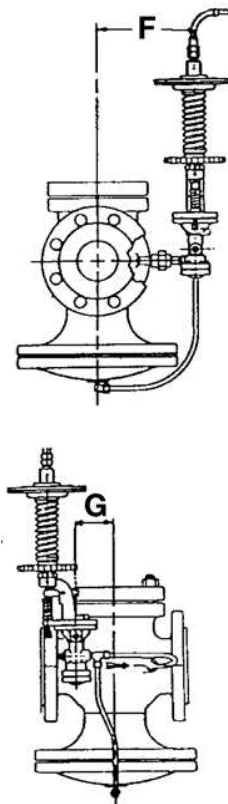
E2 VALVE
INFO PAGE 28

PILOT INFO
PAGE 72

DIMENSIONS

inches (mm)

SIZE	F	G	
		E	E2
3/8 (10)	5 3/8 (136)	1 1/4 (32)	-
1/2 (15)	5 3/8 (136)	1 1/4 (32)	-
3/4 (20)	5 5/8 (143)	1 3/8 (35)	1 3/8 (35)
1 (25)	5 3/4 (146)	1 1/2 (38)	1 1/2 (38)
1 1/4 (32)	6 (152)	1 7/8 (48)	1 7/8 (48)
1 1/2 (40)	6 1/4 (159)	2 (51)	2 (51)
2 (50)	6 5/8 (168)	2 1/8 (54)	2 1/8 (54)
2 1/2 (65)	6 3/4 (171)	2 3/8 (60)	2 3/8 (60)
3 (80)	7 1/4 (184)	2 3/4 (70)	2 3/4 (70)
4 (100)	8 (203)	3 1/2 (89)	3 1/2 (89)
5 (125)	9 (229)	3 1/2 (89)	3 1/2 (89)
6 (150)	9 7/8 (251)	4 (102)	4 (102)
8 (200)	10 1/2 (267)	6 1/4 (159)	6 1/4 (159)
10 (250)	12 1/2 (318)	6 (152)	6 (152)
12 (300)	14 (356)	8 1/2 (216)	7 1/4 (184)



Valve is tapped so that Pilot may be mounted on either side.

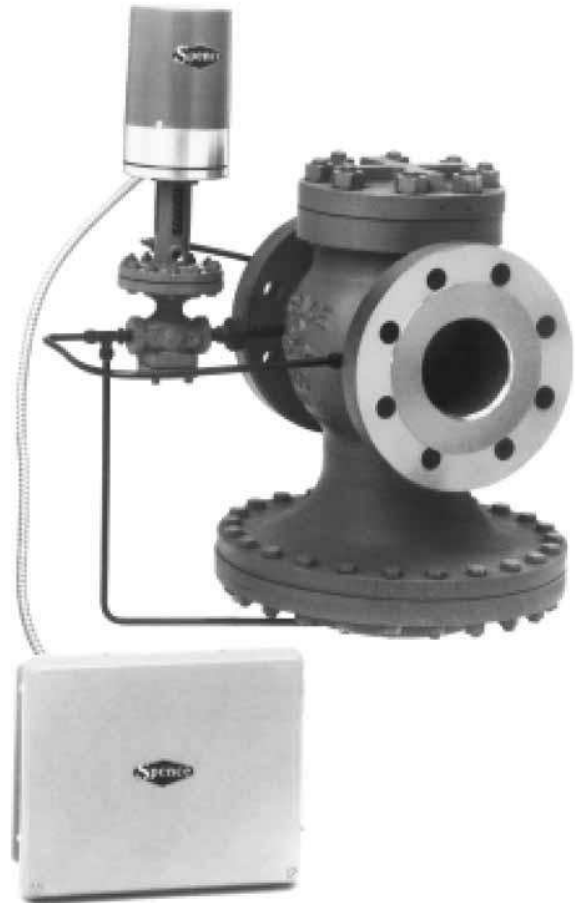


TYPE ED210 REGULATOR ELECTRONIC MODULATION

DELIVERY PRESSURES to 150 PSIG

APPLICATION DATA

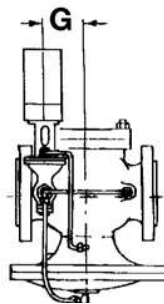
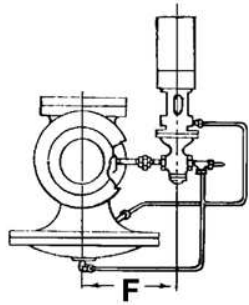
- Main Valve adapted to 4-20 mA Signal
- Requires balanced Main Valve



TYPE ED210 ELECTRONIC
MODULATING REGULATOR

DIMENSIONS inches (mm)

SIZE	F	G
3/8 (10)	5 3/8 (136)	1 1/4 (32)
1/2 (15)	5 3/8 (136)	1 1/4 (32)
3/4 (20)	5 5/8 (143)	1 3/8 (35)
1 (25)	5 3/4 (146)	1 1/2 (38)
1 1/4 (32)	6 (152)	1 7/8 (48)
1 1/2 (40)	6 1/4 (159)	2 (51)
2 (50)	6 5/8 (168)	2 1/8 (54)
2 1/2 (65)	6 3/4 (171)	2 3/8 (60)
3 (80)	7 1/4 (184)	2 3/4 (70)
4 (100)	8 (203)	3 1/2 (89)
5 (125)	9 (229)	3 1/2 (89)
6 (150)	9 7/8 (251)	4 (102)
8 (200)	10 1/2 (267)	6 1/4 (159)
10 (250)	12 1/2 (318)	6 (152)
12 (300)	14 (356)	8 1/2 (216)



Valve is tapped so that Pilot may be mounted on either side.

TYPE ED210 REGULATOR

VALVE INFO
PAGE 26

PILOT INFO
PAGE 68

TYPE ED208D
REGULATOR



TYPE ED208D PRESSURE REGULATOR ELECTRONIC STARTUP PILOT OPERATED

DELIVERY PRESSURES to 150 PSIG

APPLICATION DATA

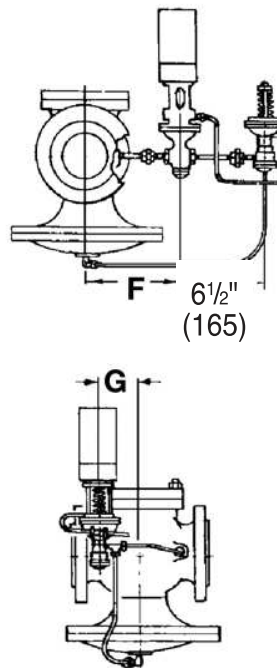
- Electronic Control of Slow Startup and/or Slow Shutdown of Pressure Regulation
- Building Heating Systems
- Can save more than 4 times it's cost in building heating in one year.
- Requires balanced Main Valve

TYPE ED208D PRESSURE REGULATOR

VALVE INFO
PAGE 26

D PILOT INFO
PAGE 46

D208 PILOT
INFO
PAGE 66



DIMENSIONS inches (mm)

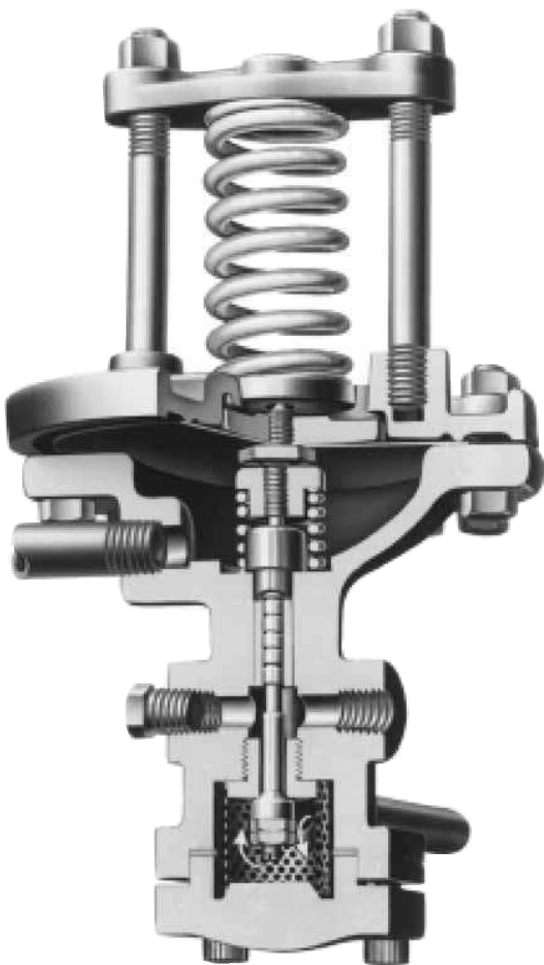
SIZE	F	G
3/8 (10)	5 3/8 (136)	1 1/4 (32)
1/2 (15)	5 3/8 (136)	1 1/4 (32)
3/4 (20)	5 5/8 (143)	1 3/8 (35)
1 (25)	5 3/4 (146)	1 1/2 (38)
1 1/4 (32)	6 (152)	1 7/8 (48)
1 1/2 (40)	6 1/4 (159)	2 (51)
2 (50)	6 5/8 (168)	2 1/8 (54)
2 1/2 (65)	6 3/4 (171)	2 3/8 (60)
3 (80)	7 1/4 (184)	2 3/4 (70)
4 (100)	8 (203)	3 1/2 (89)
5 (125)	9 (229)	3 1/2 (89)
6 (150)	9 7/8 (251)	4 (102)
8 (200)	10 1/2 (267)	6 1/4 (159)
10 (250)	12 1/2 (318)	6 (152)
12 (300)	14 (356)	8 1/2 (216)

Valve is tapped so that Pilot may be mounted on either side.



PILOTS

TYPE D
PRESSURE PILOT



TYPE D PRESSURE PILOT

TYPE D SERIES PILOTS PRESSURE REDUCING PILOTS

CONTROLS 3 to 300 PSIG

- Self Contained
- Spring Operated
- Normally Closed
- Packless Construction
- Fluid, Gas & Vapor Applications
- Accurate Regulation Unaffected by Service Conditions
- Easy In-line Maintenance

MODELS

- **TYPE D** for ± 1 psi control of delivery pressures between 3 and 150 psi.
- **TYPE D2** for control of delivery pressures between 100 and 300 psi.
- **TYPE D5** for $\pm 1/2$ psi control of delivery pressures between 1 and 25 psi.
- **TYPE D120** for exceptionally fast response controlling delivery pressures between 5 and 300 psi. To be used on large E main valves.

OPTIONS

- Spring Chamber
- Adjusting Handwheel
- Composition Disc
- Integral Mount Body
- Vacuum Spring Assembly

TYPICAL CONFIGURATIONS

- PRESSURE REDUCING**TYPE ED
- PRESSURE REDUCING**TYPE E2D
- PRESSURE REDUCING**TYPE E5D
- PRESSURE REDUCING**TYPE E6D
- WATER PRESSURE REDUCING**.....TYPE C34D
- TEMPERATURE & PRESSURE**TYPE ET14D

APPLICATION DATA

- Pressure Regulating for Steam Distribution
- Regulating for Process Control
- Can be used with Temperature Pilot to Regulate Pressure on Temperature control Application

SIZING INFO
PAGE 112

RATINGS (Maximum Inlet Conditions)

Construction	Pressure PSIG (bar)	Temperature °F (°C)
Cast Iron	250 (17.2) @	450 (232)
Cast Steel	600 (41.4) @	750 (400)

SPRING PRESSURE RANGES (PSIG)

TYPE D	TYPE D2	TYPE D5	TYPE D120
3-20 [†]	100-300	1-10	5-25
5-50 [†]		5-25	10-75
10-100			40-150
20-150			100-300

[†]With Vacuum Spring Assembly, minimum range is 30 inches Hg; maximum is reduced by 15 PSIG.

Canadian Registration # OC 0591.9C



TYPE D PRESSURE PILOT

TYPE D SERIES PILOTS

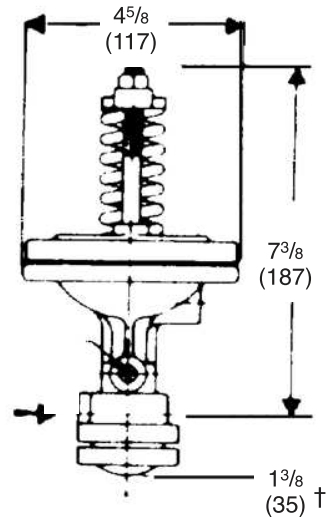
PRESSURE REDUCING PILOTS

SPECIFICATION

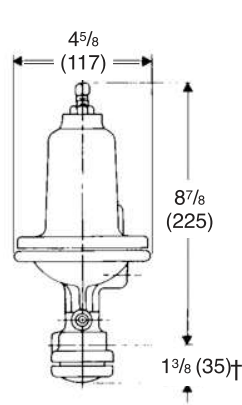
The Pilot shall be separate from the main valve and connected to it with a male union. The Pilot shall be normally closed design with packless construction. A strainer screen shall be built into the Pilot inlet. The Pilot shall be interchangeable on all sizes of main valves.

MATERIALS OF CONSTRUCTION

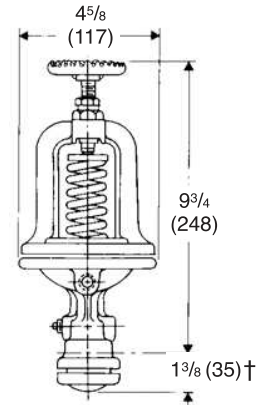
Body, Cast Iron	ASTM A126 CI B
Body, Cast Steel	ASTM A216 GR. WCB
Stem	303 St. Stl. ASTM A582 COND A
Disc	440 St. St. ASTM A276-75 COND A
Seat	420 St. Stl ASTM A276 COND A
Gasket	Non-Asbestos
Diaphragm	301 St. Stl. MIL-5-5059C
Spring	Inconel



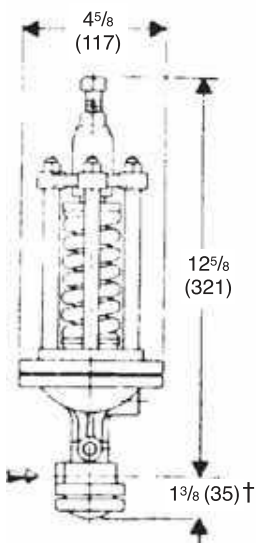
STANDARD D PILOT
7 LBS.
(3.2 KG)



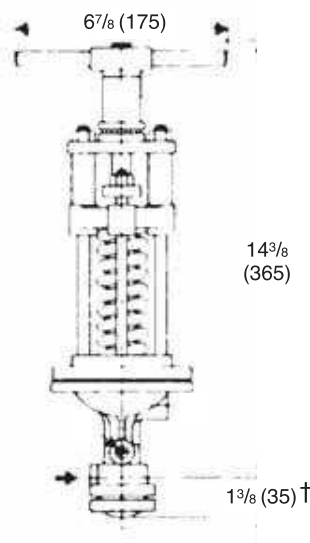
D SPRING CHAMBER
8 LBS. (3.6 KG)



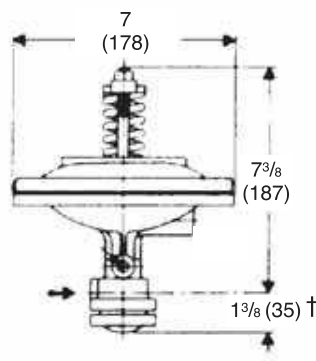
D ADJUSTING HANDWHEEL
9 LBS. (4.1 KG)



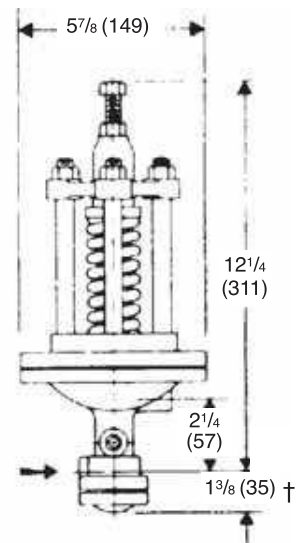
TYPE D2
10 LBS.
(4.5 KG)



D2 ADJUSTING HANDWHEEL
12 LBS. (5.4 KG)



TYPE D5
14 LBS.
(6.4 KG)

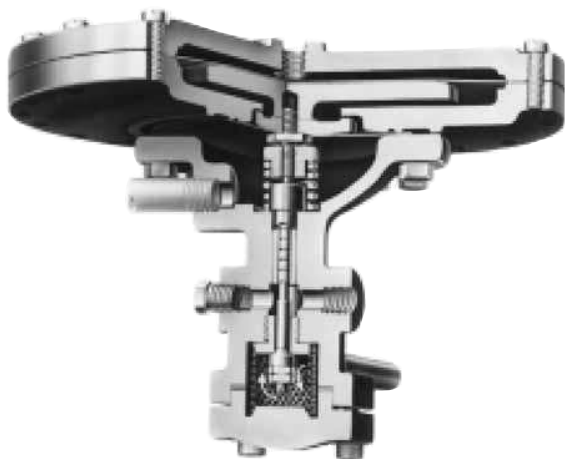


TYPE D120
16 LBS.
(7.3 KG)

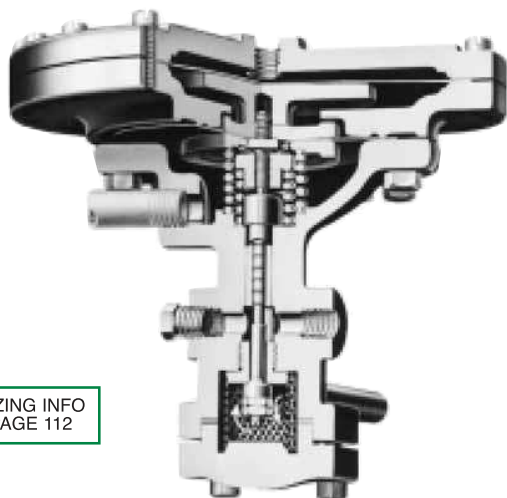
†For Integral Mount Pilot, this dimension is 5/8" (16).



TYPE A
AIR ADJUSTED PILOT



TYPE A73 AIR ADJUSTED PILOT



SIZING INFO
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TYPE A85 AIR ADJUSTED VACUUM PILOT

APPLICATION DATA

- Pressure Regulating for Remote Locations
- Pneumatic Pressure Control
- Pneumatic Temperature Control
- Process Control where Controller is Far from Pilot

RATINGS (Maximum Inlet Conditions)

Construction	Pressure PSIG (bar)	Temperature °F (°C)
Cast Iron	250 (17.2)	@ 450 (232)
Cast Steel	600 (41.4)	@ 750 (400)

TYPICAL CONFIGURATIONS

- PRESSURE REDUCING**TYPE EA
- PRESSURE REDUCING**TYPE E2A
- PRESSURE REDUCING**TYPE E5A
- PRESSURE REDUCING**TYPE E6A
- WATER PRESSURE REDUCING**TYPE C34A
- TEMPERATURE & PRESSURE**TYPE EAT61

Canadian Registration # OC 0591.9C

TYPE A SERIES PILOTS AIR ADJUSTED PILOTS

CONTROLS -30 in. hg to 150 PSIG

- Air Loaded
- Remote Control
- Spring Operated
- Normally Closed
- Packless Construction
- Economic Use of Air
- Ease of Adjustment
- Accurate to ±1 psi
- Delivery to Loading Air Pressure Ratios from 5/8 to 1 up to 6-2/3 to 1 psi
- Fluid, Gas & Vapor Applications
- Accurate Regulation Unaffected by Service Conditions
- Easy In-line Maintenance

OPTIONS

- Integral Mount
- Air Filter Regulator/Gauges

MODELS*

- **TYPE A** for pressure control at low pressures. Delivery to loading pressure is 1 to 1 psi.
- **TYPE A35** for pressure control at very low delivery pressures as in some heating system control. Delivery to loading pressure is 1/2 to 1 psi.
- **TYPE A43 & A54** for pressure control at medium to high pressures. Delivery to loading pressure is 2% to 1 psi.
- **TYPE A53** for pressure control at medium pressures. Delivery to loading pressure is 4 to 1 psi.
- **TYPE A70 & A73** for pressure control at high delivery pressures when available loading air is at low pressure. Delivery to loading pressures are 15 and 6% (respectively) to 1 psi.
- **TYPE A82** Vacuum for pressure control of very low pressure or systems varying between very low pressure and light vacuum. Delivery to loading pressure is 1 to 1 psi.
- **TYPE A83** Vacuum for temperature control. Delivery to loading pressure is 1 to 1 psi.
- **TYPE A84** Vacuum for temperature control at lower delivery pressure features more gradual response. Delivery to loading pressure is 2% to 1 psi.
- **TYPE A85** Vacuum for temperature, pressure and vacuum control. Delivery to loading pressure is 3% to 1 psi.
- **TYPE A86** for pressure control at low pressures. Delivery to loading pressure is 1 to 1 1/6 psi.
- **TYPE A87** Vacuum for temperature, pressure and vacuum control. Delivery to loading pressure is 8% to 1 psi.

*Ranges are approximate.



TYPE A SERIES PILOTS

AIR ADJUSTED PILOTS

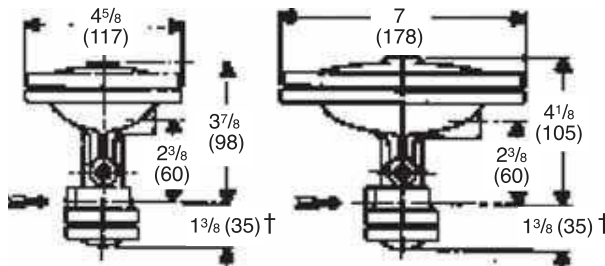
SPECIFICATION

The Pilot shall be separate from the main valve and connected to it with a male union. The Pilot shall be normally closed design with packless construction. A strainer screen shall be built into the Pilot inlet. The Pilot shall be interchangeable on all sizes of main valves.

MATERIALS OF CONSTRUCTION

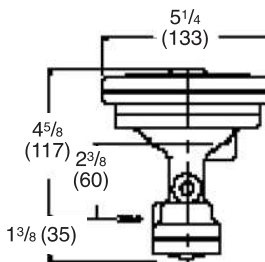
Body, Cast Iron	.....	ASTM A126 CI B
Body, Cast Steel	.....	ASTM A216 GR. WCB
Stem	.....	303 St. Stl. ASTM A582 COND A
Disc	.....	440 St. St. ASTM A276-75 COND A
Seat	.....	420 St. Stl ASTM A276 COND A
Gasket	.....	Non-Asbestos
Diaphragm	.....	301 St. Stl. MIL-5-5059C
Spring	.....	Inconel

TYPE A AIR ADJUSTED PILOT

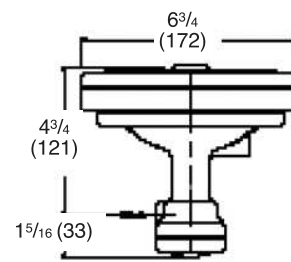


Type A or A83
6 lbs (2.7 kg)

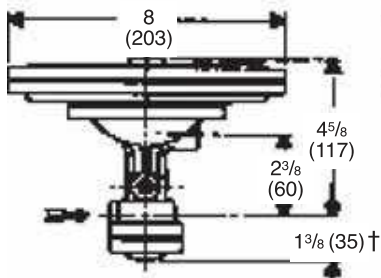
Type A82
11 lbs (5 kg)



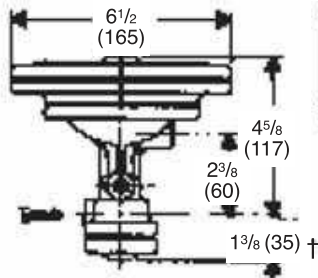
Type A43
11 lbs (5 kg)



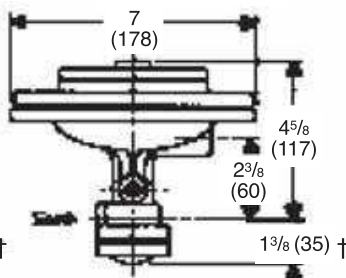
Type A54
19 lbs (8.6 kg)



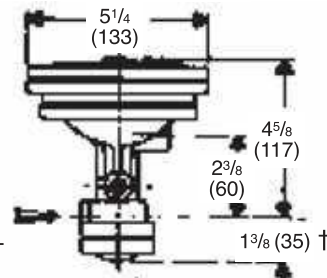
Type A73 or A70
15 lbs (6.8 kg)



Type A53 or A85
12 lbs (5.5 kg)



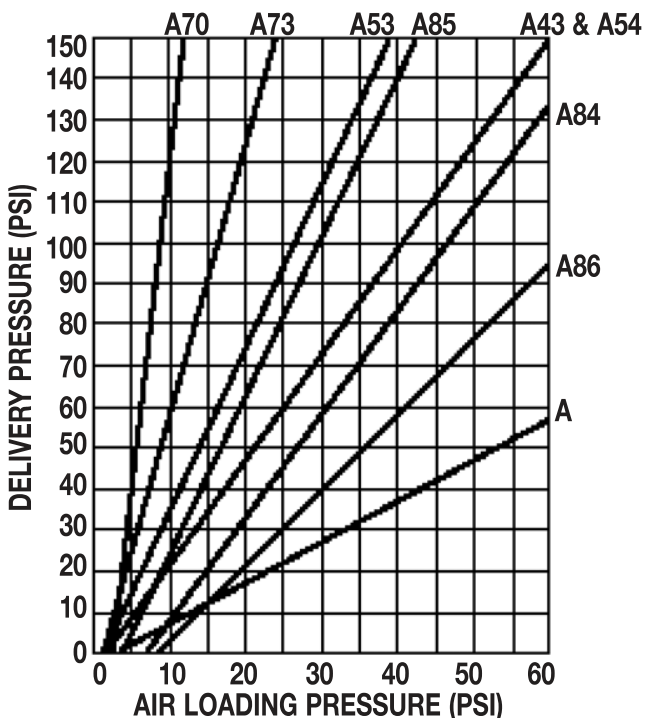
Type A35
14 lbs (6.4 kg)



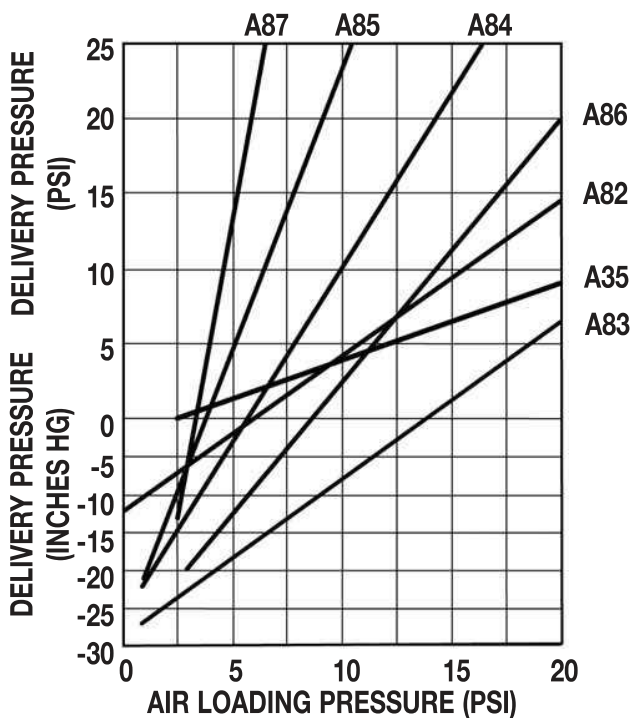
Type A84 or A86
11 lbs (5 kg)

†For Integral Mount Pilot, this dimension is 5/8" (16).

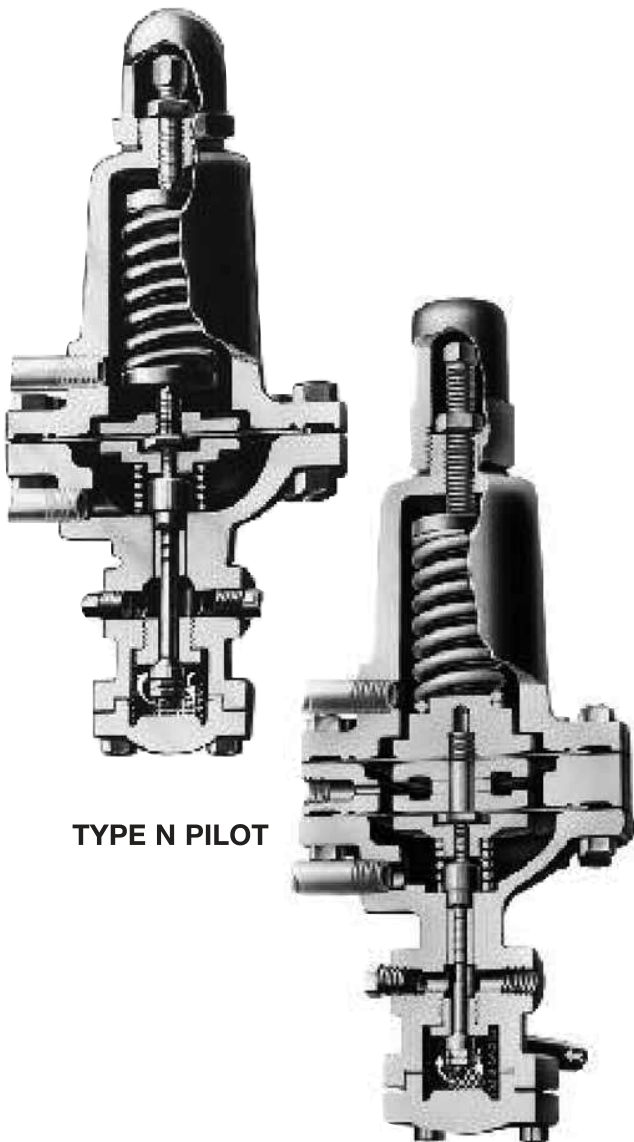
PILOTS FOR POSITIVE PRESSURE



PILOTS FOR VACUUM PRESSURE



TYPE N DIFFERENTIAL PRESSURE PILOT



TYPE N PILOT

TYPE N33 PILOT

TYPE N SERIES PILOTS

DIFFERENTIAL PRESSURE PILOTS

CONTROLS 3 to 150 PSIG

- Self Contained
- Spring Operated
- Normally Closed
- Packless Construction
- Accurate to ± 1 psi
- Four Adjustable Spring Ranges
- Fluid, Gas & Vapor Applications
- Loading Pressure Supplied by any Fluid
- Accurate Regulation Unaffected by Service Conditions
- Easy In-line Maintenance

OPTIONS

- Integral Mount (for N and N33)

MODELS

- **TYPE N** for delivery pressure at set differential above loading pressure. Available in four spring ranges. Includes integral strainer.
- **TYPE N20** for fixed differential between regulator's inlet pressure and some other lower pressure.
- **TYPE N33** for delivery pressure at set differential above loading pressure where it is essential there be no mixing of two fluids. Ensured by two diaphragms, separated by a vented space. Available in four spring ranges. Includes integral strainer.

APPLICATION DATA

- Boiler Feedwater Makeup
- Steam Atomizing for Oil Burners
- Heat Exchanger to maintain Constant Differential

RATINGS (Maximum Inlet Conditions)

Construction	Pressure PSIG (bar)	Temperature °F (°C)
Cast Iron	250 (17.2)	@ 450 (232)
Cast Steel	600 (41.4)	@ 750 (400)

SPRING PRESSURE RANGES (PSIG)

3-20	10-100
5-50	20-150

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TYPICAL CONFIGURATIONS

- PRESSURE REDUCINGTYPE EN
- PRESSURE REDUCINGTYPE E2N
- PRESSURE REDUCINGTYPE E5N

TYPE N SERIES PILOTS

DIFFERENTIAL PRESSURE PILOTS

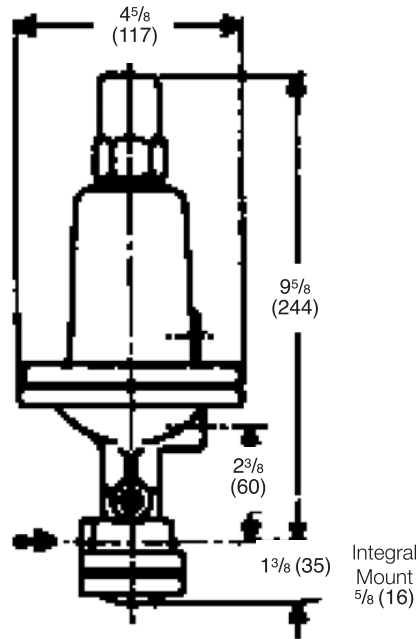
SPECIFICATION

The Pilot shall be separate from the main valve and connected to it with a male union. The Pilot shall have packless construction. The Pilot shall be interchangeable on all sizes of main valves.

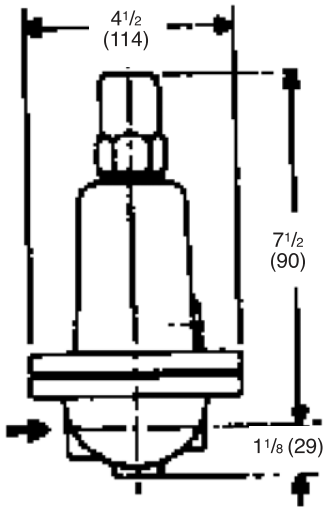
MATERIALS OF CONSTRUCTION

Body, Cast Iron	ASTM A126 CI B
Body, Cast Steel	ASTM A216 GR. WCB
Stem	303 St. Stl. ASTM A582 COND A
Disc	440 St. St. ASTM A276 COND A
Seat	420 St. Stl ASTM A276 COND A
Gasket	Non-Asbestos
Diaphragm	301 St. Stl. MIL-5-5059C
Spring	Inconel

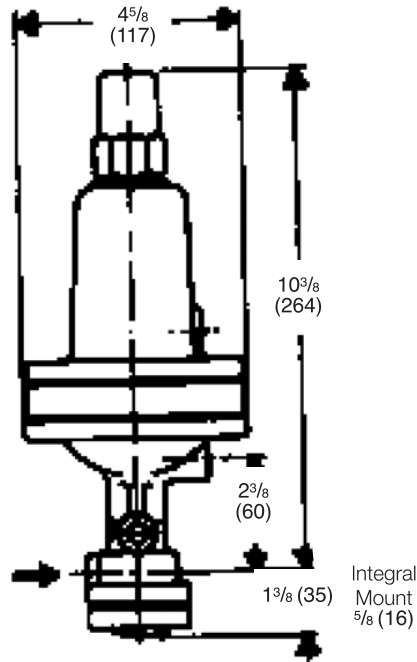
TYPE N DIFFERENTIAL PRESSURE PILOT



TYPE N PILOT
8 LBS.
(3.6 KG)



TYPE N20 PILOT
8 LBS.
(3.6 KG)



TYPE N33 PILOT
11 LBS.
(5 KG)

TYPE P PUMP GOVERNOR PILOT



TYPE P14 PILOT

TYPE P SERIES PILOTS

PUMP GOVERNOR PILOTS

CONTROLS 3 to 600 PSIG

- Self Contained
- Spring Operated
- Normally Open
- ANSI/FCI 70-2 Class IV Shutoff
- Packless Construction
- Accurate to ±1 psi
- Three Adjustable Spring Ranges
- Steam Applications
- Constant Average Discharge Pressure
- Accurate Regulation Unaffected by Service Conditions
- Easy In-line Maintenance

OPTIONS

- Adjustment Indicator
- Integral Mount

MODELS

- **TYPE P13** features a spring for controlling pressures 100 to 300 PSI.
- **TYPE P14** features three spring ranges for controlling pressures 5 to 150 PSI.
- **TYPE P15** features two spring ranges for controlling pressures 3 to 25 PSI.
- **TYPE P32** is piston driven and features three spring ranges for controlling pressures 200 to 2000 PSI.

TYPICAL CONFIGURATIONS

- STEAM PUMP CONTROLTYPE EP
- STEAM PUMP CONTROL.....TYPE E2P
- STEAM PUMP CONTROL.....TYPE E5P

APPLICATION DATA

- Steam Driven Pump Control
- Steam Generated Output Control

RATINGS (Maximum Inlet Conditions)

Construction	Pressure PSIG (bar)	Temperature °F (°C)
Cast Iron	250 (17.2) @	450 (232)
Cast Steel	600 (41.4) @	750 (400)

SPRING PRESSURE RANGES (PSIG)

Model	Spring Range 1 (PSIG)	Spring Range 2 (PSIG)	Spring Range 3 (PSIG)
P13	100-300		
P14	5-30	20-100	40-150
P15	3-10	5-25	
P32	200-450	400-600	

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PAGE 120



TYPE P SERIES PILOTS

PUMP GOVERNOR PILOTS

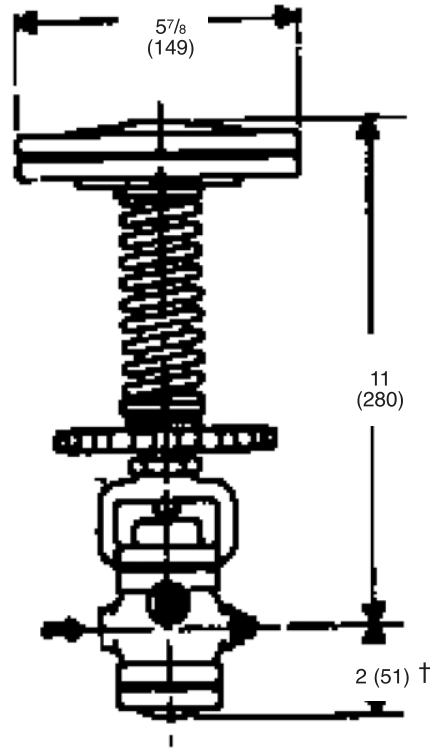
SPECIFICATION

The Pilot shall be separate from the main valve and connected to it with a male union. The Pilot shall be normally open design with packless construction. A strainer screen shall be built into the Pilot inlet. The Pilot shall be interchangeable on all sizes of main valves. The pilot shall automatically adjust pump discharge pressures within the spring range to maintain a constant average pressure.

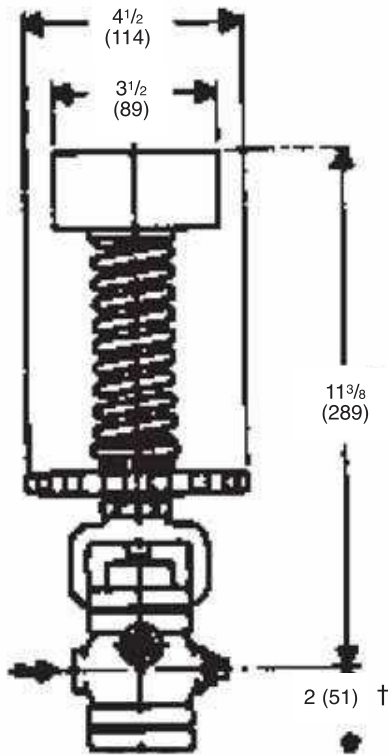
MATERIALS OF CONSTRUCTION

Body, Cast Iron	ASTM A126 CI B
Body, Cast Steel	ASTM A216 GR. WCB
Stem	2024-T4 ASTM B211-75
Disc	440 St. St. ASTM A276-75 COND A
Seat	420 St. St. ASTM A276 COND A
Gasket	Non-Asbestos
Diaphragm	301 St. St. MIL-5-5059C
Spring	Steel ASTM A231

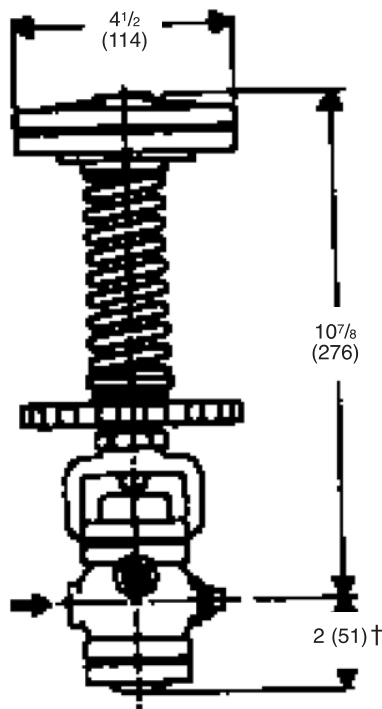
TYPE P PUMP GOVERNOR PILOT



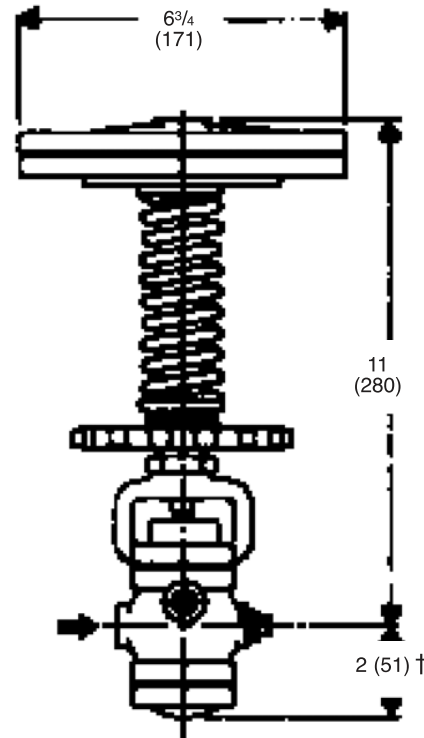
TYPE P14 PILOT
13 LBS.
(5.9 KG)



TYPE P32 PILOT
10 LBS.
(4.5 KG)



TYPE P13 PILOT
11 LBS.
(5 KG)



TYPE P15 PILOT
15 LBS.
(6.8 KG)

†For Integral Mount Pilot, this dimension is 1 1/16" (27).



TYPE F46 VACUUM PUMP GOVERNOR PILOT



TYPE F46 PILOT

TYPE F46 VACUUM PUMP GOVERNOR PILOT

CONTROLS to -30" Hg

- Self Contained
- Spring Operated
- Normally Closed
- ANSI/FCI 70-2 Class IV Shutoff
- Packless Construction
- Accurate to ±1 psi
- Steam Applications
- Constant Average Discharge Pressure
- Accurate Regulation Unaffected by Service Conditions
- Easy In-line Maintenance

OPTIONS

- Adjustment Indicator
- Integral Mount

TYPICAL CONFIGURATIONS

- VACUUM PUMP CONTROLTYPE EF46
- VACUUM PUMP CONTROLTYPE E2F46
- VACUUM PUMP CONTROLTYPE E5F46

APPLICATION DATA

- Steam Driven Vacuum Pump Control

RATINGS (Maximum Inlet Conditions)

Construction	Pressure PSIG (bar)	Temperature °F (°C)
Cast Iron	250 (17.2)	@ 450 (232)
Cast Steel	600 (41.4)	@ 750 (400)

SPRING PRESSURE RANGES (PSIG)

30" hg-0 psi

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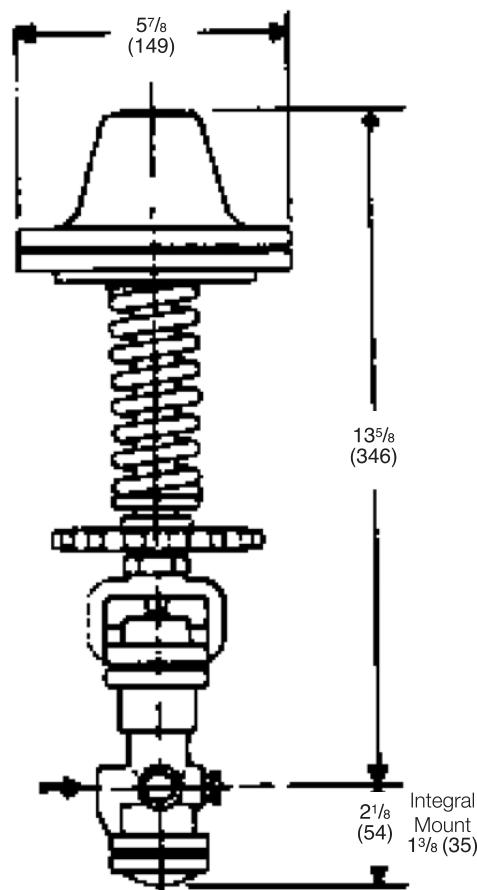
TYPE F46 VACUUM PUMP GOVERNOR PILOT

SPECIFICATION

The Pilot shall be separate from the main valve and connected to it with a male union. The Pilot shall be normally open design with packless construction. A strainer screen shall be built into the Pilot inlet. The Pilot shall be interchangeable on all sizes of main valves. The pilot shall automatically adjust pump discharge pressures within the spring range to maintain a constant average pressure.

MATERIALS OF CONSTRUCTION

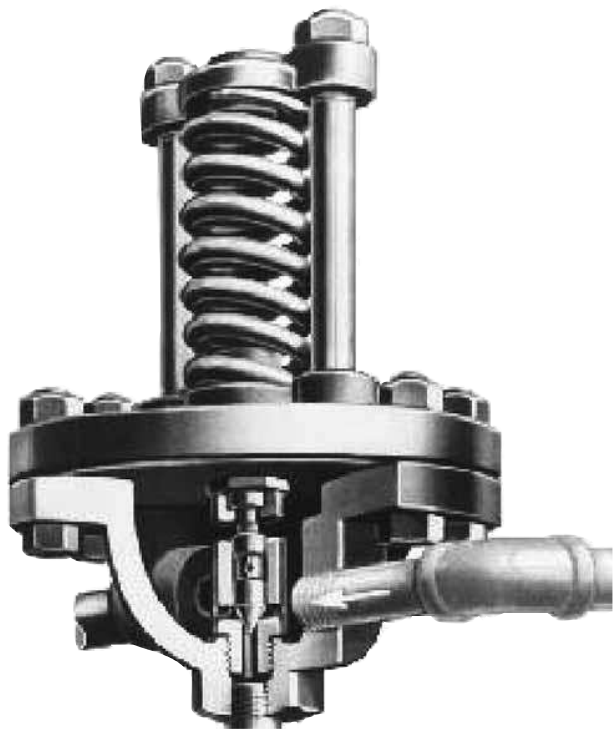
Body, Cast Iron	ASTM A126 CI B
Body, Cast Steel	1018 St. ASTM A108-79
Stem.....	303 St. St. ASTM A582 COND A
Disc	440 St. St. ASTM A276-75 COND A
Seat	420 St. St. ASTM A276 COND A
Gasket	Non-Asbestos
Diaphragm	301 St. St. MIL-5-5059C
Spring	Inconel



TYPE F46 VACUUM
PUMP GOVERNOR PILOT

TYPE F46 PILOT
15 LBS.
(6.8 KG)

TYPE Q BACK
PRESSURE PILOT



TYPE Q PILOT

TYPE Q SERIES PILOTS BACK PRESSURE PILOTS

CONTROLS 3 to 300 PSIG

- Self Contained
- Spring Operated
- Normally Open
- Packless Construction
- Four Adjustable Spring Ranges
- Fluid, Gas & Vapor Applications
- Loading Pressure Supplied by any Fluid
- Accurate Regulation Unaffected by Service Conditions
- Easy In-line Maintenance

OPTIONS

- Enclosed Spring Chamber
- Adjusting Handle
- High Pressure

MODELS

- **TYPE Q** for ± 1 psig accuracy controlling back pressures between 3 and 150 psig.
- **TYPE Q2** for ± 2 psig accuracy controlling back pressures between 100 and 300 psig.
- **TYPE Q73** air adjusted for ± 1 psig accuracy controlling back pressure at high retained pressures when available loading air is at low pressure. Delivery to loading pressure is 6-2/3 to 1 psig.

TYPICAL CONFIGURATIONS

- BACK PRESSURE CONTROL.....TYPE EQ
- BACK PRESSURE CONTROLTYPE E2Q
- BACK PRESSURE CONTROLTYPE E5Q

SIZING INFO
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APPLICATION DATA

- Pump Bypass
- Maintain Upstream Pressure in Steam Distribution Systems
- Maintain Upstream Pressure in Liquid Distribution Systems

RATINGS (Maximum Inlet Conditions)

Construction	Pressure PSIG (bar)	Temperature °F (°C)
Cast Iron	250 (17.2) @	450 (232)
Cast Steel	600 (41.4) @	750 (400)

SPRING PRESSURE RANGES (PSIG)

TYPE Q	TYPE Q2
3-20	100-300
5-50	
10-100	
20-150	

Canadian Registration # OC 0591.9C

TYPE Q SERIES PILOTS

BACK PRESSURE PILOTS

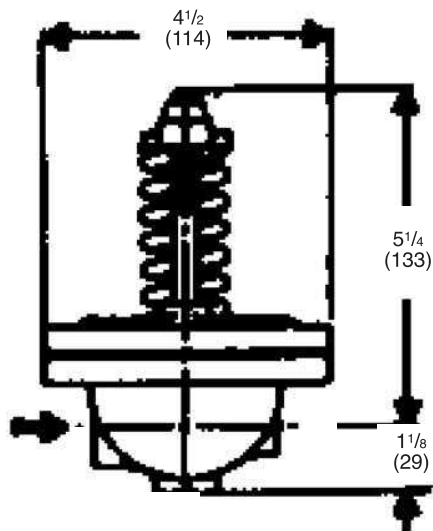
SPECIFICATION

The Pilot shall be separate from the main valve and connected to it with a male union. The Pilot shall be normally closed design with packless construction. A strainer screen shall be built into the Pilot inlet. The Pilot shall be interchangeable on all sizes of main valves.

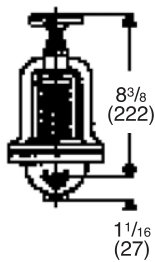
MATERIALS OF CONSTRUCTION

Body, Cast Iron	ASTM A126 CI B
Body, Cast Steel	ASTM A216 GR. WCB
Disc .....	.440 St. St. ASTM A276-75 COND A
Seat .....	.440 St. St. ASTM A276-75 COND A
Gasket	Non-Asbestos
Diaphragm	301 St. Stl. MIL-5-5059C
Spring	Steel

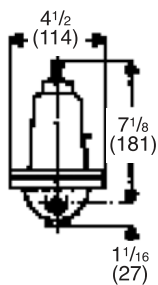
TYPE Q BACK PRESSURE PILOT



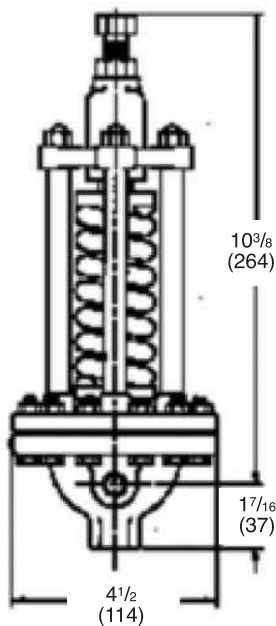
TYPE Q PILOT
7 LBS.
(3.2 KG)



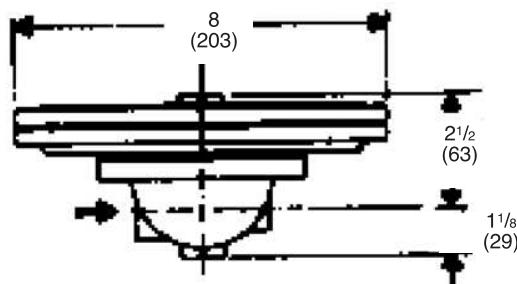
ADJUSTING HANDWHEEL



SPRING CHAMBER



TYPE Q2 PILOT
10 LBS.
(4.5 KG)



TYPE Q73 PILOT
15 LBS.
(6.8 KG)

TYPE F BACK PRESSURE PILOT



TYPE F32 PILOT

TYPE F SERIES PILOTS BACK PRESSURE PILOTS

CONTROLS 2 to 600 PSIG

- Self Contained
- Spring Operated
- Normally Closed
- ANSI/FCI 70-2 Class IV Shutoff
- Packless Construction
- Four Adjustable Spring Ranges
- Operates on remote/local pressure source
- Not Affected by Static Head
- Accurate Regulation Unaffected by Service Conditions

MODELS

- **TYPE F13** for ± 1 psi control of back pressure between 100 and 300 psi.
- **TYPE F14** for ± 2 psi control of back pressure between 3 and 150 and 300 psi.
- **TYPE F15** for $\pm 1/2$ psi control of back pressure between 2 and 25 psi.
- **TYPE F32** for ± 10 psi control of back pressure between 200 and 600 psi.

OPTIONS

- Adjustment Indicator
- Integral Mount

TYPICAL CONFIGURATIONS

- BACK PRESSURE CONTROLTYPE EF**
- BACK PRESSURE CONTROLTYPE EF14D**
- BACK PRESSURE CONTROLTYPE E2F**
- BACK PRESSURE CONTROLTYPE E5F**

APPLICATION DATA

- Steam Backpressure Control
- Steam Backpressure Control with long control pipes
- Backpressure controlled by change in pressure of secondary fluid
- Backpressure control where a water leg on the pilot diaphragm cannot be avoided*

RATINGS (Maximum Inlet Conditions)

Construction	Pressure PSIG (bar)	Temperature °F (°C)
Cast Iron	250 (17.2) @	450 (232)
Cast Steel	600 (41.4) @	750 (400)

SPRING PRESSURE RANGES (PSIG)

TYPE F13	TYPE F14	TYPE F15	TYPE F32
100-300	3-30	2-10	200-450
	20-100	5-25	400-600
	40-150		

Canadian Registration # OC 0591.9C



TYPE F SERIES PILOTS

BACK PRESSURE PILOTS

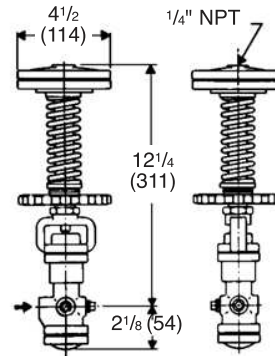
SPECIFICATION

Pilot shall be separate from the main valve and connected to it with a male union. The pilot shall be normally closed design with packless construction. A strainer screen shall be built into the pilot inlet. The pilot shall be interchangeable on all sizes of main valves.

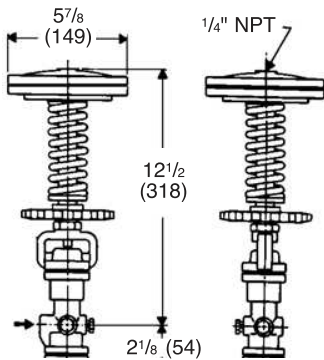
MATERIALS OF CONSTRUCTION

Body, Cast Iron	ASTM A126 CI B
Body, Cast Steel	ASTM A216 GR. WCB
Stem	2024-T4 ASTM B211-75
Disc	440 St. St. ASTM A276-75 COND A
Seat	420 St. St. ASTM A276 COND A
Gasket	Non-Asbestos
Diaphragm	301 St. St. MIL-5-5059C
Spring	Steel ASTM A231

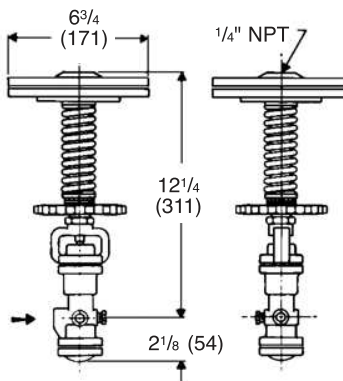
TYPE F BACK PRESSURE PILOT



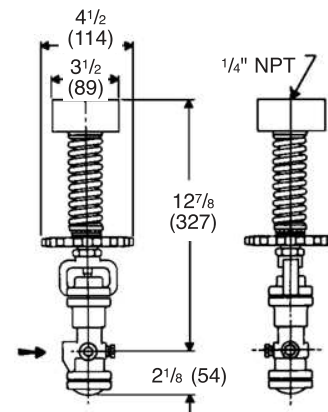
TYPE F13 PILOT
12 LBS. (5.5 KG)



TYPE F14 PILOT
14 LBS. (6.4 KG)



TYPE F15 PILOT
15 LBS. (6.8 KG)



TYPE F32 PILOT
12 LBS. (5.5 KG)



TYPE P125 TRIP STOP PILOT

TYPE P125 TRIP STOP PILOT

SHUTOFF 5 to 175 PSI

- Self Contained
- Spring Operated
- Normally Closed
- Packless Construction
- Easy In-line Maintenance
- Quickly shuts off steam flow in the event of an over pressure condition
- Factory preset and tested for desired trip set point
- Trip setting unaffected by service conditions
- Manual reset feature keeps system safely shut down until control is regained

APPLICATION DATA

- Safety Shutoff For Over Pressure Conditions
- May Be Used When Conditions Disallow Use of SRV

RATINGS (Maximum Inlet Conditions)

Construction	Pressure PSIG (bar)	Temperature °F (°C)
Cast Iron	250 (17.2) @	450 (232)
Cast Steel	600 (41.4) @	750 (400)

SPRING PRESSURE RANGES

5-25	10-50
40-150	150-175

Canadian Registration # OC 0591.9C

TYPICAL CONFIGURATIONS

- OVER PRESSURE SHUTDOWNEP125
- OVER PRESSURE SHUTDOWNESP125
- OVER PRESSURE SHUTDOWNE2P125

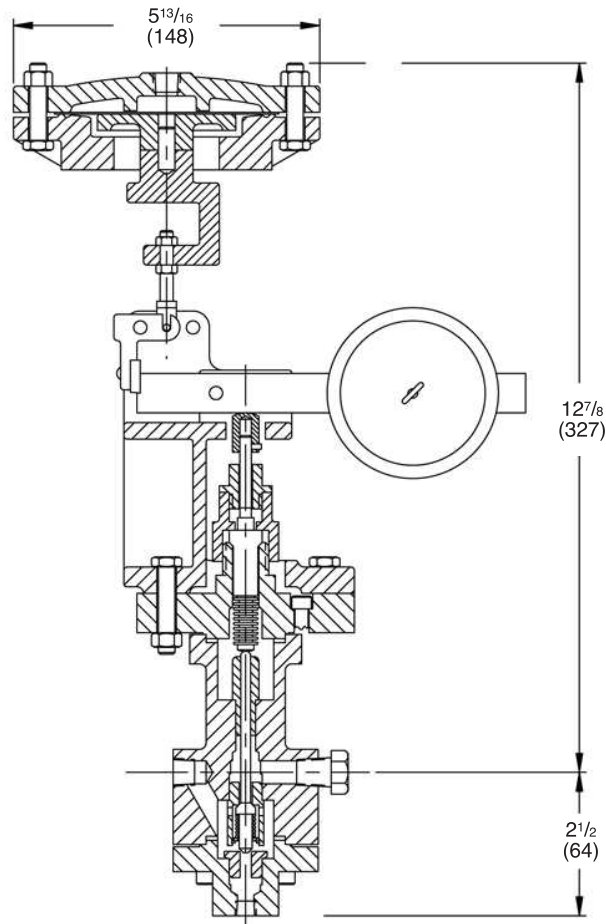
TYPE P125 TRIP STOP PILOT

SPECIFICATION

The Trip Stop Pilot shall be separate from the main valve and connected to it with a male union. The Pilot shall be normally closed design with packless construction. A strainer screen shall be built into the Pilot inlet. The Pilot shall be interchangeable on all sizes of main valves. The trip stop pilot shall maintain a Spence main valve in the open position while system pressure remains below set pressure. The pilot shall trip in the event of system overpressure, shutting main valve. Pilot shall be manually resettable and maintain safe shut off until reset.

MATERIALS OF CONSTRUCTION

Body, Cast Iron	ASTM 126 Cl. B
Body, Carbon Steel	ASTM 216 Gr. WCB
Stem	303 St. Stl. ASTM 582 Cond. A
Disc	440 St. Stl. ASTM 276-75 Cond. A
Seat	304 St. Stl. ASTM 276 Cond. A
Gasket	Non-asbestos



TYPE P125 PILOT

TYPE P125 TRIP STOP PILOT
CAST IRON 26 LBS. (12 KG)
CAST STEEL 28 LBS. (13 KG)

TYPE SP/P PRESSURE SAFETY PILOT



TYPE SP/P PRESSURE SAFETY PILOT

CONTROLS to 600 PSIG

- Self Contained
- Spring Operated
- Normally Closed
- Packless Construction
- Fluid, Gas & Vapor Applications
- Accurate Regulation Unaffected by Service Conditions
- Easy in-line Maintenance

TYPICAL CONFIGURATIONS

PRESSURE REDUCING.....TYPE EDSP/P
 PRESSURE REDUCINGTYPE E5DSP/P

TYPE SP/P PRESSURE SAFETY PILOT

APPLICATION DATA

- Where overpressure could cause personal injury or damage

RATINGS (Maximum Inlet Conditions)

Construction	Pressure PSIG (bar)	Temperature °F (°C)
Cast Bronze	250 (17.2) @	400 (204)
Cast Steel	600 (41.4) @	750 (400)

SPRING PRESSURE RANGES (PSIG)

5-13	31-65	121-175
13-30	66-120	

Canadian Registration # OC 0591.9C



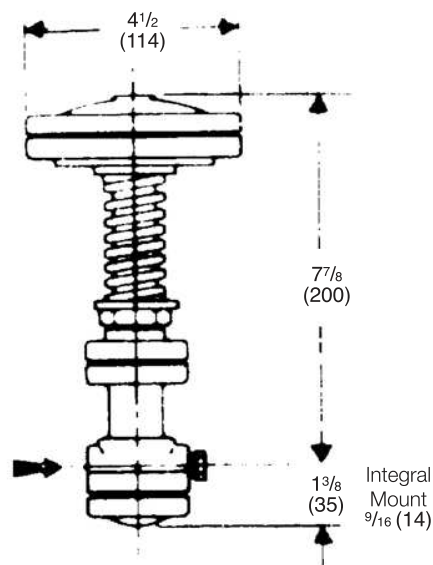
TYPE SP/P PRESSURE SAFETY PILOT

SPECIFICATION

Pilot to be used to prevent an accidental rise in reducing valve pressure and not to be used as substitute for a safety relief valve. Valve is normally closed. Body to be cast steel rated 600 psig 750°F or bronze rated 300 psig 500°F. Valve must provide for easy in line maintenance and of packless construction. Operating pressure range to be determined by spring selection.

MATERIALS OF CONSTRUCTION

Body, Cast Bronze	ASTM B61-80 C92200
Body, Cast Steel	ASTM A216 GR. WCB
Stem.....	303 St. St. ASTM A582 COND A
Disc	440 St. St. ASTM A276 COND A
Seat	420 St. St. ASTM A276 COND A
Gasket	Non-Asbestos
Diaphragm	301 St. St. MIL-5-5059C
Spring	Inconel



**TYPE SP/P PRESSURE
SAFETY PILOT
8 LBS. (3.6 KG)**

TYPE SP/P PRESSURE
SAFETY PILOT

TYPE M PILOT



TYPE M SOLENOID PILOT

APPLICATION DATA

- Remote Electronic Shutoff of Regulators

RATINGS (Maximum Inlet Conditions)

Model	Pressure PSIG (bar)	Temperature °F (°C)
M24, M25	250 (17.2)	@ 200 (93)
M26, M27	125 (8.6)	@ 180 (82)
M32LP, M33, M34LP, M35LP	125 (8.6)	@ 363 (178)
M32HP, M33HP, M34HP	250 (17.2)	@ 406 (208)

Canadian Registration # OC 0591.9C

TYPE M SERIES PILOTS SOLENOID PILOTS

CONTROLS to 250 PSI

- **Fast Acting for Quick Response**
- **Available Normally Open or Normally Closed**

MODELS*

- **TYPE M24** 3-way normally open for cold fluids in straight solenoid valve applications
- **TYPE M25** 3-way normally closed for cold fluids in straight solenoid valve applications
- **TYPE M26** 2-way normally open for cold fluids in multiple pilot arrangements
- **TYPE M27** 2-way normally closed for cold fluids in multiple pilot arrangements
- **TYPE M32** 2-way normally open for steam or other hot fluid services in multiple pilot arrangements
- **TYPE M33** 2-way normally closed for steam or other hot fluid services in multiple pilot arrangements
- **TYPE M34** 3-way normally open for steam or other hot fluid services in straight solenoid valve applications
- **TYPE M35** 3-way normally closed for steam or other hot fluid services in straight solenoid valve applications

* For M32, M33, M34, M35 Pilots, add LP suffix for low pressure and HP suffix for high pressure

TYPICAL CONFIGURATIONS

- PRESSURE REDUCINGEMD**
- TEMPERATURE REGULATINGEMT14**
- TEMPERATURE & PRESSUREEMT134**
- TEMPERATURE & PRESSUREEMT14D**
- DIFFERENTIAL PRESSURE REDUCING ...E5M33N33**

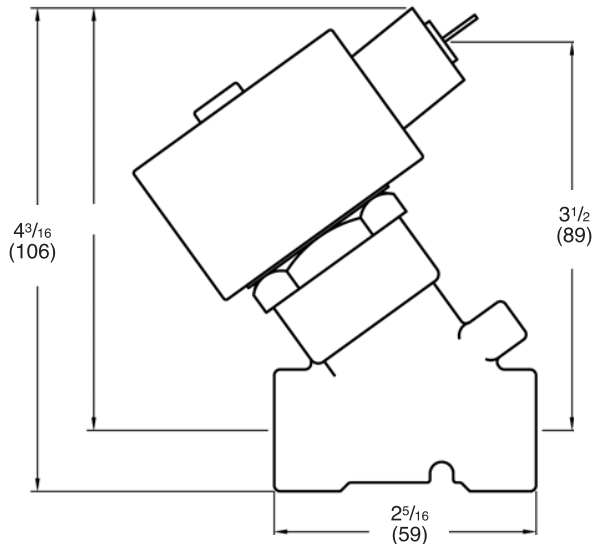
TYPE M SERIES PILOTS SOLENOID PILOTS

SPECIFICATION

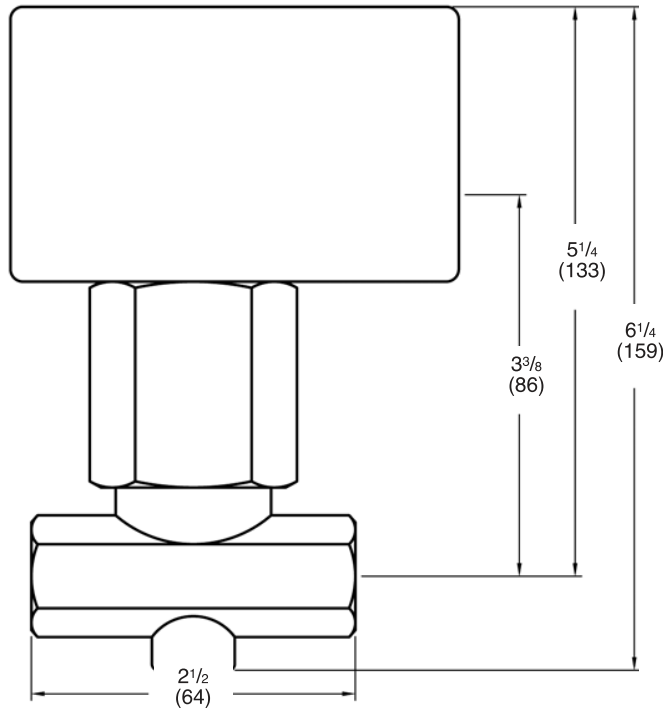
The actuator pilot shall open or close the controlled system via an external control signal. Actuator pilot shall be available in both fail open or fail closed upon loss of signal. Actuator pilot shall mount outside the main valve and provide remote on/off operation for a wide range of control variables.

MATERIALS OF CONSTRUCTION

Head	Epoxy Coated aluminum (NEMA1)
.....	Polypropylene (NEMA 4)
Body	Brass
Internal Core Assembly	Ferrous & Brass
Bonnet Gasket	EPDM



**TYPE M33 SOLENOID PILOT 125#
3 LBS. (1.4 KG)**



**TYPE M33 SOLENOID PILOT 250#
6 LBS. (2.7 KG)**

TYPE M PILOT

TYPE D208
ACTUATOR PILOT



TYPE D208 ELECTRONIC ACTUATOR PILOT WITH ELECTRONIC TIME CONTROLLER

CONTROLS to 150 PSIG

- Can save more than 4 times it's cost in building heating in one year.
- Controlled Incremental Positioning of Main Valve
- Electronic Time Controller (ETC) Opens and/or Closes Valve in up to 96 Minute Time Period*
- Ambient Temperatures 20 to 120 °F (-7 to 49°C)
- For use with Balanced Main Valve only

OPTIONS

- Back-up (B.U.) Power Supply for up to 6 hours continued service during power failure.
- Explosion proof actuator, NEMA

TYPICAL CONFIGURATIONS

SLOW OPEN/CLOSE PRESSUREED208D

TYPE D208 ELECTRONIC PILOT ACTUATOR

APPLICATION DATA

- Building Control Systems

RATINGS

D208	120VAC, 50-60HZ, .3 AMPS
ETC	120VAC, 50-60HZ, .3 AMPS
B.U. Power Supply	120VAC, 60HZ, up to 6 AMPS

Canadian Registration # OC 0591.9C

*Timing periods are selectable from 6-96 minutes in 6 minute increments by setting a binary dip switch.



TYPE D208 ELECTRONIC ACTUATOR PILOT WITH ELECTRONIC TIME CONTROLLER

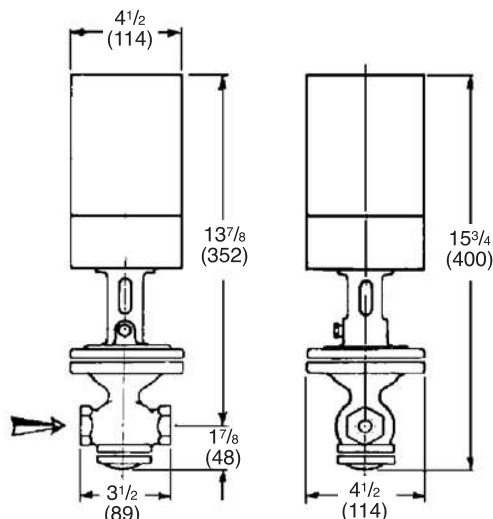
SPECIFICATION

The Actuator Pilot shall slowly close and/or open the steam system in a safe, quiet manner by incrementally reducing and/or increasing the pressure under the main valve diaphragm until it reaches dead-end shutoff or is fully open. In the event of a power failure, it shall stop in its present position unless a back-up power supply is specified. Such backup power supply shall provide a minimum of specified hours of operation and be maintained in a fully charged standby condition automatically.

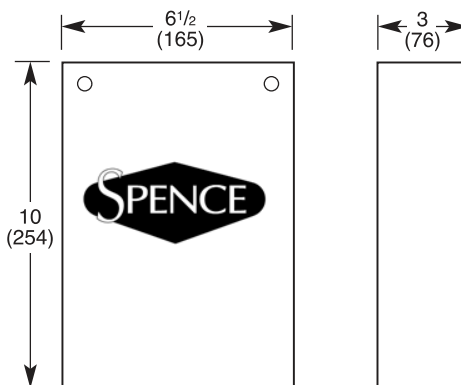
The Actuator Pilot shall be controlled by a totally solid state Electronic Time Controller which shall incrementally open and/or close the Actuator Pilot with 320 pulses in periods from 1-1/2, 2-1/2, 3, 6 - 96 minutes and shall be field adjustable in multiples of 6 minutes.

MATERIALS OF CONSTRUCTION

Body, Cast Iron	.....ASTM 126 Cl. B
Body, Carbon Steel	.....ASTM 216 Gr. WCB
Stem	.....303 St. Stl. ASTM 582 Cond. A
Disc	.....440 St. Stl ASTM 276-75 Cond. A
Seat	.....420 St. Stl. ASTM 276 Cond. A
Gasket	.....Non-asbestos



**TYPE D208 ELECTRONIC
ACTUATOR PILOT**



**TYPE D208 ELECTRONIC
TIME CONTROLLER (ETC)**

TYPE D208
ACTUATOR PILOT



TYPE D210
ACTUATOR PILOT



TYPE D210 ELECTRONIC ACTUATOR PILOT WITH MODULATING SERVO-AMPLIFIER

CONTROLS to 150 PSIG

- Modulate Process Variable in Relation to a Proportional Control Input Signal
- Servo-Amplifier provides Continuous Signal for Immediate Response
- Ambient Temperatures 20 to 120°F (-7 to 49°C)
- For use with Balanced Main Valve only

OPTIONS

- Back-up Power Supply for up to 6 hours continued service during power failure.
- Explosion proof actuator, NEMA
- Fail-Safe Device to stroke Actuator half or full open on input signal failure.

TYPICAL CONFIGURATIONS

4-20 mA PROPORTIONAL CONTROLED210

TYPE D210 ELECTRONIC PILOT ACTUATOR

APPLICATION DATA

- Building Control Systems

RATINGS

D210	120VAC, 50-60HZ, .3 AMPS
Servo-Amplifier	120VAC, 50-60HZ, .3 AMPS
B.U. Power Supply	120VAC, 60HZ, up to 6 AMPS

INPUT SIGNALS

1-5mA	10-50mA
4-20mA	Selectable from 0-24 VDC

Canadian Registration # OC 0591.9C



TYPE D210 ELECTRONIC ACTUATOR PILOT WITH MODULATING SERVO-AMPLIFIER

SPECIFICATION

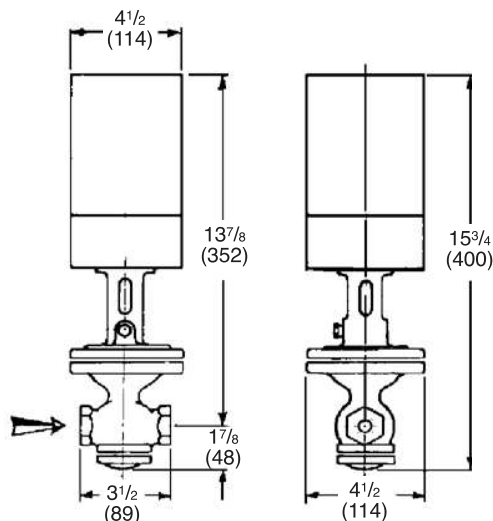
The Actuator Pilot shall maintain a system and modulate that system as requirements dictate. A continuous signal (1-5mA, 4-20mA, 10-50mA or 0-24 VCD) is transmitted by the system control to the Servo-Amplifier which positions the Actuator Pilot.

In the event of a power failure, the Actuator Pilot shall stop in its present position unless a back-up power supply is specified. Such backup power supply shall provide a minimum of specified hours of operation and be maintained in a fully charged standby condition automatically.

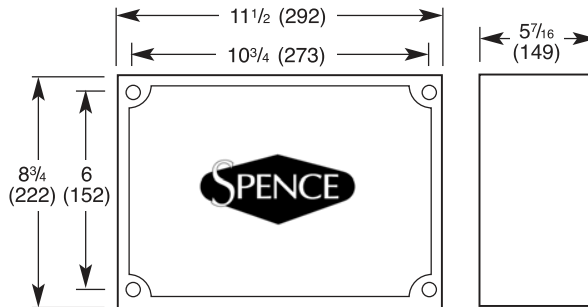
In the event of signal failure, the Actuator Pilot shall close unless a Fail-Safe Device is specified in the Servo-Amplifier which will be factory set to stroke the Actuator Pilot half open or full open.

MATERIALS OF CONSTRUCTION

- Body, Cast IronASTM 126 Cl. B
- Body, Carbon SteelASTM 216 Gr. WCB
- Stem303 St. Stl. ASTM 582 Cond. A
- Disc440 St. Stl. ASTM 276-75 Cond. A
- Seat304 St. Stl. ASTM 276 Cond. A
- GasketNon-asbestos



**TYPE D210 ELECTRONIC
ACTUATOR PILOT**



TYPE D210 SERVO-AMPLIFIER

TYPE D210
ACTUATOR PILOT





APPLICATIONS

- E-Main Valve Pilot (Pressure / Temperature)
- Building Control Systems
- SCADA
- PLC
- Upgrading E Main Installations for Automated Control

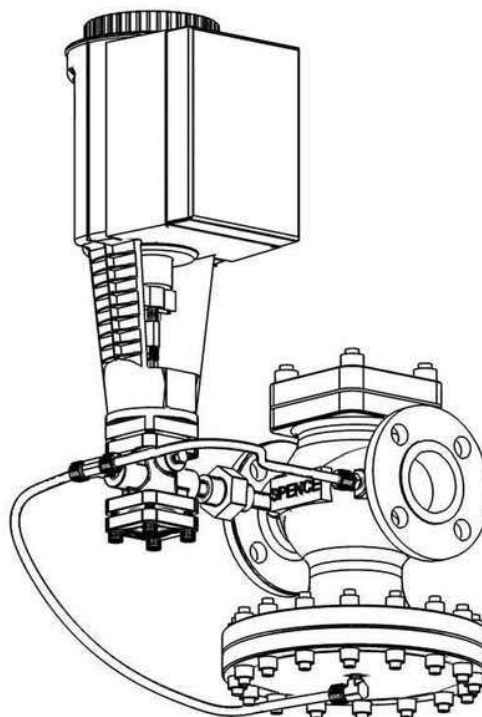
ELECTRONIC DATA

- 4-20 mA or 0-10 VDC Input Signals
- 24 VAC 50-60 Hz Power Supply
- 17VA/12W Power Consumption
- UL Listed (UL873)

TYPE VH210 ELECTRONIC ACTUATOR PILOT

Inlet Pressures to 250 PSIG

- **Modulate Process Variable in Relation to a Proportional Control Input Signal**
- **Spring Return Fail Closed** — Returns actuator to a closed position on power loss in 3 seconds or less.
- **Manual Override** — Allows simple field adjustment on signal or power loss.
- **NEMA 1 Enclosure** — Protects electronic components from industrial environments.
- **High Thrust Motor** — Allows Class IV shutoff.
- **Rapid Response** — Reacts to direct changes in 0-10 VDC or 4-20 mA signals from process controllers.
- **Cast Aluminum Yoke and Housing** — Provides years of trouble free actuator operation.
- **Standard Pilot Lower Body** — Uses proven design for dependability and compatibility with existing Spence Pilot installations.
- **Seamless Integration** — Balanced Main valve construction not required.
- **Multi Variable Control** — Pressure and Temperature control when integrated with additional Spence pilot.



TYPE VH210

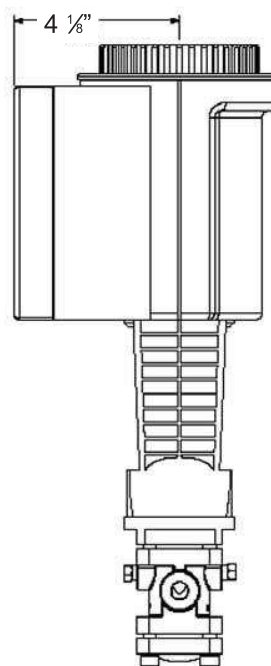
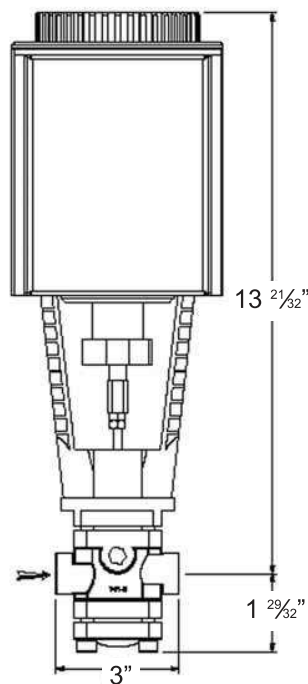
ELECTRONIC ACTUATOR PILOT

SPECIFICATION

The electronic actuator pilot shall maintain a system variable and modulate the valve travel in response to that system variable as requirements dictate. A continuous signal (4-20mA, 0-10 VDC) is transmitted by the system controller to the actuator which positions the valve stem. In the event of power loss, the electronic actuator pilot shall return to a closed position.

MATERIALS OF CONSTRUCTION

Body, Cast Iron.....	ASTM 126 CI B
Body, Cast Steel	ASTM A216 GR. WCB
Stem.....	303 SS ASTM 582 Cond. A
Disc.....	440 SS ASTM 276-75 Cond. A
Seat.....	304 SS ASTM 276 Cond. A
Gasket.....	Non-Asbestos



TYPE VH210
ACTUATOR PILOT

**TYPE VH210 ELECTRONIC PILOT
12.5 LBS (5.7 KG)**

TYPE T124/134 TEMP/
PRESSURE PILOT



TYPE T124/134 TEMPERATURE/ PRESSURE PILOTS

CONTROLS 20 to 500°F

- Precise, Rapid Response
- Vapor Tension Thermostat Spring Operated
- Self Contained
- Normally Open
- Packless Construction
- Fluid, Gas and Vapor Applications
- Strainer Screen Built-in
- Easy in-line Maintenance
- Temperature and Pressure in One Pilot

MODELS

- **TYPE T124** for heater operating pressures between 20 and 125 psi.
- **TYPE T134** for heater operating pressures up to 20 psi.

OPTIONS

- Stainless Steel Flexible Tubing
- Thermostat Well
- Stainless Steel Capillary Tubing
- Dial Thermometer
- Tubing longer than 10'
- Integral Mount
- Thermostat other than #700 (see Options Section)

TYPE T134 TEMPERATURE/PRESSURE PILOT

APPLICATION DATA

- Instantaneous Water Heaters
- Oil Heaters
- Storage Heaters
- Process Heaters
- Jacketed Kettles
- Vats
- Driers
- Ovens

RATINGS (Maximum Inlet Conditions)

Construction	Pressure PSIG (bar)	Temperature °F (°C)
Cast Iron	250 (17.2) @	450 (232)
Cast Steel*	600 (41.4) @	750 (400)

TEMPERATURE RANGES (°F)

20-120	150-300	300-400
50-150	170-270	330-430
70-170	250-350	400-500
120-220	290-390	

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*Cast Steel available in T134 only.

THERMOSTATS

700	706	731
701	708	732
702	711	740
703	712	800
704	713	801

TYPICAL CONFIGURATIONS

TEMPERATURE & PRESSURE	ET124
TEMPERATURE & PRESSURE	ET134
TEMPERATURE & PRESSURE	E2T134
TEMPERATURE & PRESSURE	E5T124

TYPE T124/134 TEMPERATURE/ PRESSURE PILOTS

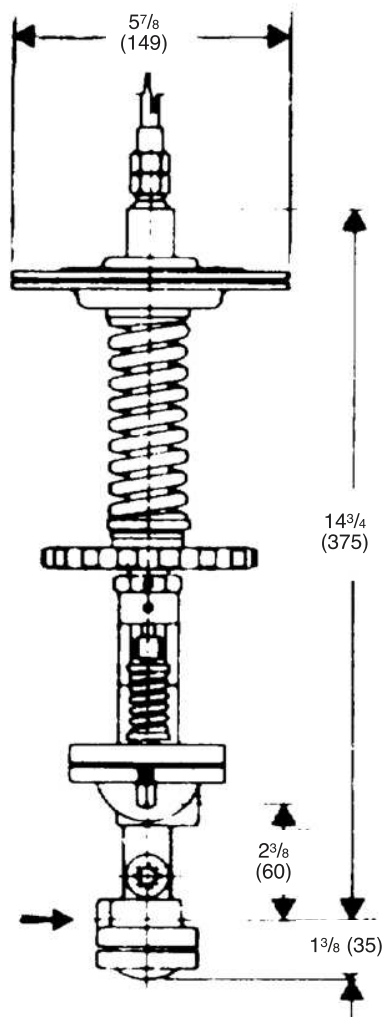
SPECIFICATION

Pilot valve shall be separate from the main valve and connected to it by unions. Pilot seats shall be protected by built-in strainer screens. Pilots shall be interchangeable on all sizes of main valves. Thermal elements shall provide a 100°F (38°C) range of temperature adjustment and shall withstand 100°F (38°C) overheating without damage. Handwheel adjustment for temperature shall be standard. Unless otherwise scheduled, thermal elements shall be equipped with 10 feet of brass flexible tubing. Number 700 bronze bulb and Number 728 bronze well shall be included except with instantaneous heaters serving intermittent demand. Steel wells shall be supplied for fuel oil service on storage tank applications.

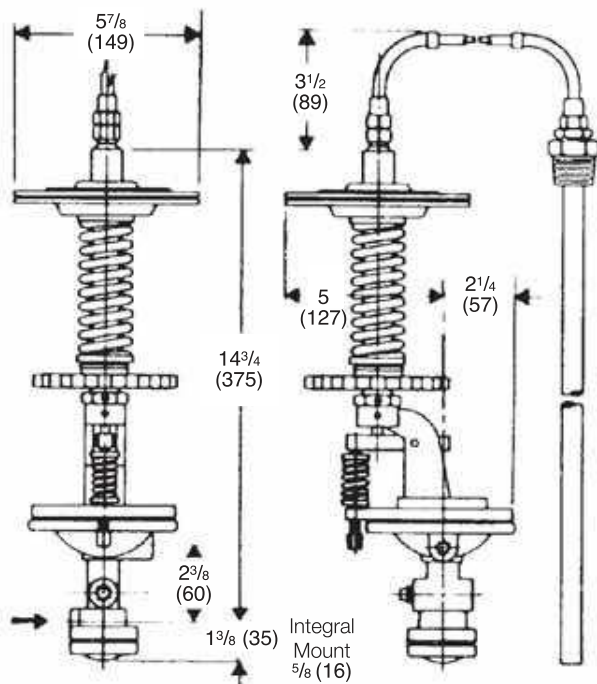
MATERIALS OF CONSTRUCTION

Body, Cast Iron	ASTM A126 CI B
Body, Cast Steel	ASTM A216 WCB
Stem	416 St. Stl. ASTM A582-75
Disc	440 St. St. ASTM A582 COND A
Seat	420 St. Stl ASTM A582 COND A
Gasket	Graphite
Diaphragm	301 St. Stl. MIL-5-5059C
Spring	Steel

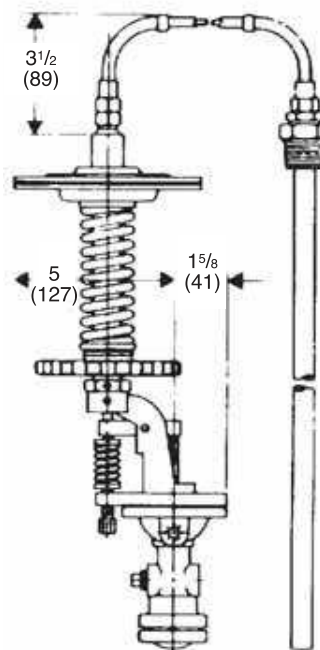
TYPE T124/134 TEMP/ PRESSURE PILOT



**TYPE T124 PILOT
16 LBS. (7.3 KG)**



**TYPE T134 PILOT
18 LBS. (8.2 KG)**



TYPE T14 TEMPERATURE PILOT



TYPE T14 TEMPERATURE PILOT

APPLICATION DATA

- Storage Heaters
- Jacketed Kettles
- Vats

RATINGS (Maximum Inlet Conditions)

Construction	Pressure PSIG (bar)	Temperature °F (°C)
Cast Iron	250 (17.2) @	450 (232)
Cast Steel	600 (41.4) @	750 (400)

TEMPERATURE RANGES (°F)

Temperature Range (°F)	Pressure Range (PSIG)	Temperature Range (°F)
20-120	150-300	300-400
50-150	170-270	330-430
70-170	250-350	400-500
120-220	290-390	

Canadian Registration # OC 0591.9C

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TYPE T14

VAPOR TENSION TEMPERATURE PILOT

CONTROLS 20 to 500°F

- Precise, Rapid Response
- Spring Operated
- Self Contained
- Normally Open, Direct Operation (Heating)
- Packless Construction
- Fluid, Gas and Vapor Applications
- Strainer Screen Built-in
- Easy in-line Maintenance

OPTIONS

- Stainless Steel Flexible Tubing
- Stainless Steel Capillary Tubing
- Tubing longer than 10'
- Thermostat Well
- Dial Thermometer
- Integral Mount
- Thermostat other than #700 (see Bulb Options, pg 82)

THERMOSTATS

700	706	731
701	708	732
702	711	740
703	712	
704	713	

TYPICAL CONFIGURATIONS

TEMPERATURE REGULATING	.....ET14
TEMPERATURE & PRESSURE	.....ET14D
TEMPERATURE REGULATING	.....E2T14
TEMPERATURE & PRESSURE	.....E2T14D
TEMPERATURE REGULATING	.....E5T14
TEMPERATURE & PRESSURE	.....E5T14D

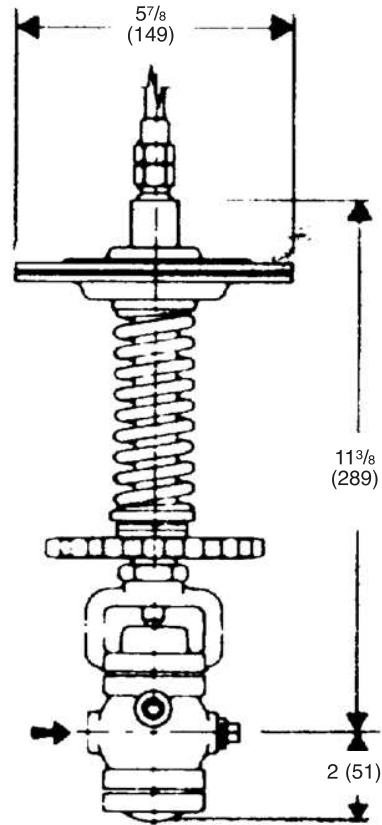
TYPE T14 VAPOR TENSION TEMPERATURE PILOT

SPECIFICATION

Pilot valve shall be separate from the main valve and connected to it by unions. Pilot seats shall be protected by built-in strainer screens. Pilot shall be interchangeable on all sizes of main valves. Thermal elements shall provide a 100°F (38°C) range of temperature adjustment and shall withstand 100°F overheating without damage. Handwheel adjustment for temperature shall be standard. Unless otherwise scheduled, thermal elements shall be equipped with 10 feet of brass flexible tubing. Number 700 bronze bulb, Number 728 bronze well shall be supplied for storage tank applications. Steel wells shall be supplied for fuel oil service.

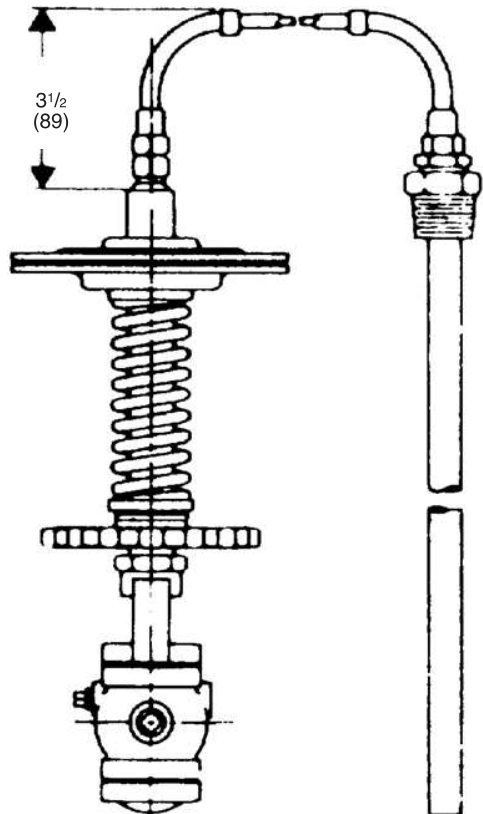
MATERIALS OF CONSTRUCTION

Body, Cast Iron	ASTM A126 CI B
Body, Cast Steel	ASTM A216 GR. WCB
Stem	2024-T4 ASTM B211-75
Disc	440 St. St. ASTM A276-75 COND A
Seat	420 St. St. ASTM A276 COND A
Gasket	Graphite
Diaphragm	Bronze ASTM B103-77 UNS C51000
Spring	Steel



TYPE T14
TEMPERATURE PILOT

TYPE T14 TEMPERATURE PILOT
13 LBS. (6 KG)



TYPE T52
TEMPERATURE PILOT



TYPE T52 TEMPERATURE PILOT

TYPE T52 TEMPERATURE PILOT

CONTROLS 20 to 500°F

- Spring Operated
- Self Contained
- Normally Closed, Indirect Operation (Cooling)
- Packless Construction
- Fluid, Gas and Vapor Applications
- Strainer Screen Built-in
- Easy in-line Maintenance

OPTIONS

- Stainless Steel Flexible Tubing
- Stainless Steel Capillary Tubing
- Tubing longer than 10'
- Thermostat Well
- Dial Thermometer
- Integral Mount
- Thermostat other than #700 (see Bulb Options, pg 82)

THERMOSTATS

700	706	731
701	708	732
702	711	740
703	712	800
704	713	801

TYPICAL CONFIGURATIONS

COOLING	C34T52
COOLING & PRESSURE	C34T52D
COOLING	E6T52
COOLING & PRESSURE.....	E6T52D
COOLING	ET52
COOLING & PRESSURE	ET52D
COOLING	E2T52
COOLING & PRESSURE.....	E2T52D
COOLING	E5T52
COOLING & PRESSURE.....	E5T52D

APPLICATION DATA

- Control Flow of Cooling Liquid
- Blending

RATINGS (Maximum Inlet Conditions)

Construction	Pressure PSIG (bar)	Temperature °F (°C)
Cast Iron	250 (17.2) @	450 (232)
Cast Steel	600 (41.4) @	750 (400)

TEMPERATURE RANGES (°F)

20-120	150-300	300-400
50-150	170-270	330-430
70-170	250-350	400-500
120-220	290-390	

Canadian Registration # OC 0591.9C

SIZING INFO
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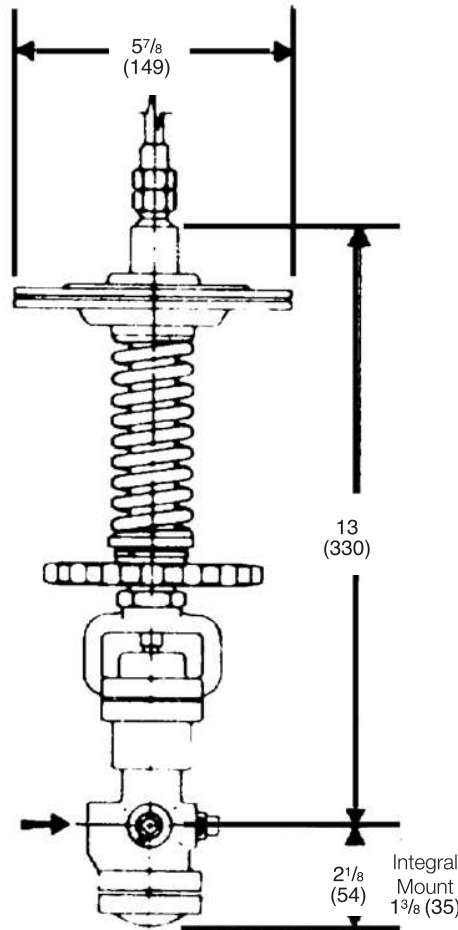
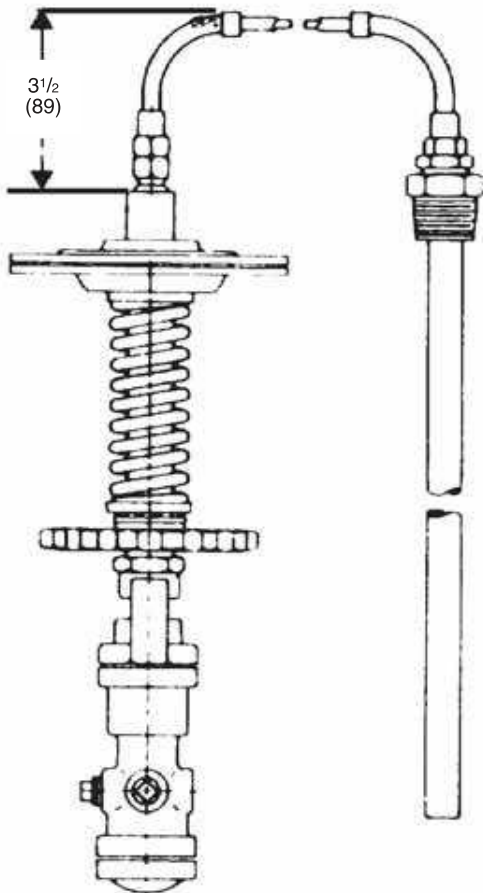
TYPE T52 TEMPERATURE PILOT

SPECIFICATION

Pilot valve is for cooling applications (reverse acting). Pilot valve shall be separate from the main valve and connected to it by unions. Pilot seats shall be protected by built-in strainer screens. Pilot shall be interchangeable on all sizes of main valves. Thermal elements shall provide a 100°F (38°C) range of temperature adjustment and shall withstand 100°F overheating without damage. Handwheel adjustment for temperature shall be standard. Unless otherwise scheduled, thermal elements shall be equipped with 10 feet of brass flexible tubing. Number 700 bronze bulb, Number 728 bronze well shall be supplied for storage tank applications. Steel wells shall be supplied for fuel oil service.

MATERIALS OF CONSTRUCTION

Body, Cast Iron	ASTM A126 C53
Body, Steel	ASTM A108-79
Stem	303 St. Stl ASTM 582 Cond. A
Disc	440 St. Stl. ASTM 276-75 Cond. A
Seat	420 St. Stl ASTM 276 Cond. A
Gasket	Graphite
Diaphragm	PH Bronze
Spring	Inconel



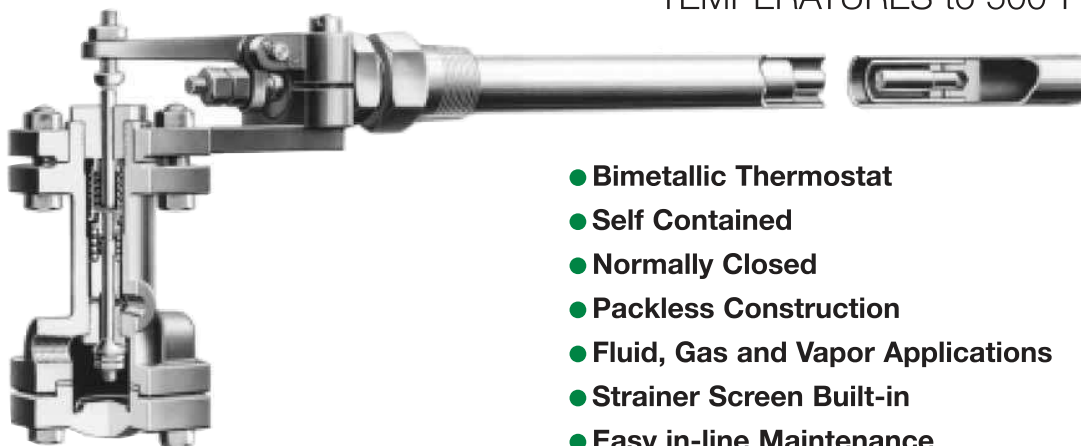
**TYPE T52 PILOT
14 LBS. (6.4 KG)**

**TYPE T52
TEMPERATURE PILOT**

TYPE SP/T TEMP. SAFETY PILOT

TYPE SP/T TEMPERATURE SAFETY PILOT

TEMPERATURES to 500°F



- Bimetallic Thermostat
- Self Contained
- Normally Closed
- Packless Construction
- Fluid, Gas and Vapor Applications
- Strainer Screen Built-in
- Easy in-line Maintenance

TYPE SP/T TEMPERATURE SAFETY PILOT

APPLICATION DATA

- Where overheating could cause personal injury or damage

RATINGS (Maximum inlet Conditions)

Construction	Pressure PSIG (bar)	Temperature °F (°C)
Cast Bronze	300 (21.0)	500°F (260°C)
Cast Steel	600 (41.3)	750°F (400°C)

TEMPERATURE RANGES (°F)

0-500

MATERIALS OF CONSTRUCTION

BodyBronze ASTM B61-80 UNS C92200
 Stem303 St. Stl. ASTM A582 Cond A
 Disc440C St. Stl. ASTM A276-75 Cond A
 Seat420 St. Stl. ASTM A276 Cond A
 GasketNon-asbestos
 BellowsBronze
 BulbBronze ASTM B62-80 UNS C31400

TYPICAL CONFIGURATIONS

TEMPERATURE REGULATINGET14SP/T

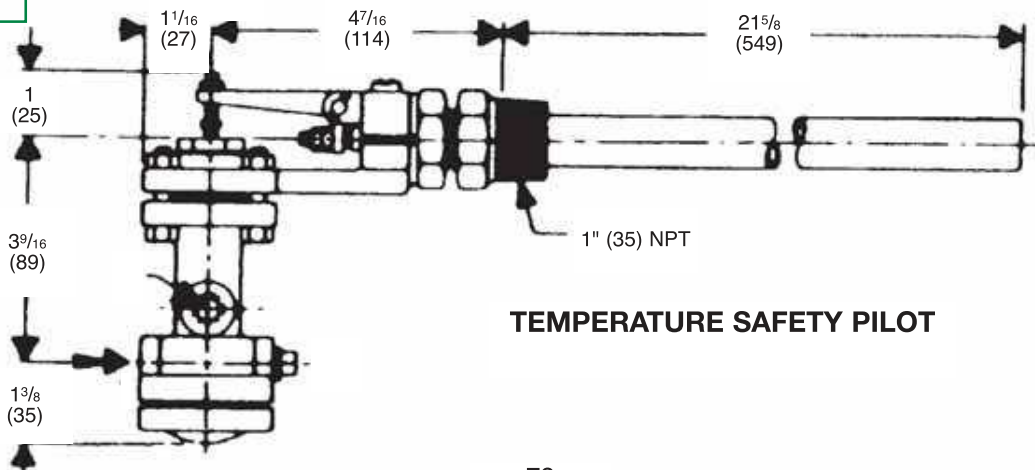
TEMPERATURE REGULATINGET134SP/T

SPECIFICATION

Pilot to be used to insure that pressure regulator will not fail open. Pilot to be bronze, with stainless steel trim. Pilot to be normally closed and to employ a bimetallic element that will ensure that the pilot will fail open. Pilot to be of packless construction to provide for long service life. Pilot to have a built in strainer for protection.

Canadian Registration # OC 0591.9C

SIZING INFO
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TEMPERATURE SAFETY PILOT



TYPE T61, T62, T63, T64 PNEUMATIC TEMPERATURE CONTROLLERS

TEMPERATURES to 350°F

- Bimetallic Thermostat for Fast Response
- Pinpoint Accuracy
- 200°F Adjustable Temperature Range
- Air Consumption - Average .25, Maximum .7
- Adjustable Proportional Band 1/4-2 psi per 1°F
- Overtemperature Protection
- Air Supply Pressure 30 psi

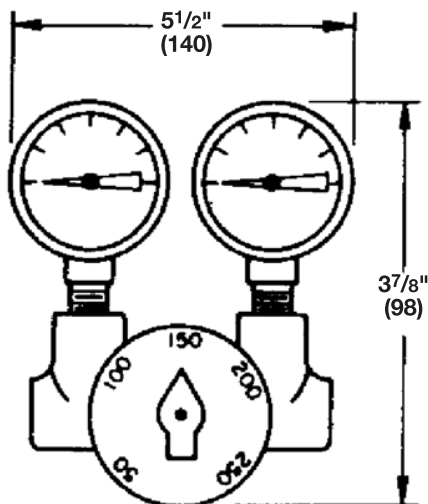
MODELS

- **TYPE T61** for applications where air control signal decreases as process temperature increases.
- **TYPE T62** for applications where air control signal increases as process temperature increases.
- **TYPE T63** for high temperature applications where air control signal decreases as process temperature increases.
- **TYPE T64** for sanitary applications where air control signal decreases as process temperature increases. Supplied with IAMD Sanitary Cap.

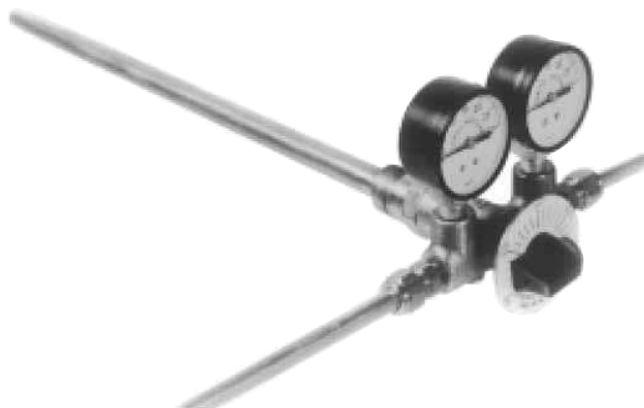
TYPICAL CONFIGURATIONS

PRESSURE & TEMPERATUREEA85T61

SIZING INFO
PAGE 114



**TYPE T61, T62, T63, T64
CONTROLLER**
1 1/2 LBS (.7 KG)



**TYPE T61 PNEUMATIC
TEMPERATURE CONTROLLER**

TYPE T61, 62, 63, T64
TEMPERATURE PILOT

APPLICATION DATA

- Instantaneous Heaters
- Process Applications with wide ranging, fast changing loads

RATINGS (Maximum Inlet Conditions)

Pressure PSIG (bar)	Temperature °F (°C)
250 (17.2)	400 (204)

TEMPERATURE RANGES (°F)

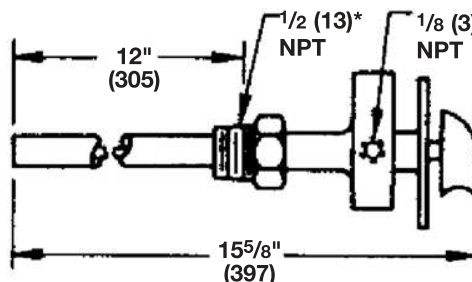
T61, T62, T64	50-250
T63	150-350

SPECIFICATION

The temperature controller shall be of the non-indicating type. It shall be equipped with 0-30 psi supply and loading gages. The controller shall have 200°F adjustable range and be equipped with a bronze bulb as part of its bimetal thermostat. Control point adjustments to be made by a knob on the temperature pilot and throttling range shall be adjustable externally with a set screw wrench. A stainless steel thermostat bulb, preferable in lieu of a well, is available as an alternate to bronze.

MATERIALS OF CONSTRUCTION

Body	Bronze ASTM B62-80 UNS C83600
Bulb, Bronze	ASTM B140-80 UNS C31400
Bulb, Steel.....	316 St. Stl. ASTM A276 Cond. A
Seals	Viton
Spool	Brass ASTM B16-80 UNS 36000
Spring	St. Steel



* For T64, this is IAMD Sanitary Cap.

MATERIAL SPECIFICATIONS FOR MAIN VALVES & PILOTS

MAIN VALVE & PILOT BODIES

Cast Iron.....	ASTM A126	Class B
Cast Carbon Steel.....	ASTM A216	WCB
Cast Bronze	ASTM B61	C92200

STEEL PLATE FLANGES & HOODS-FLANGE QUALITY

.....	ASTM A285	Grade C
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NUTS

Steel Valves	ASTM A194-79	Grade 2H
Cast Iron Valves.....	SAE J995	Grade 2

STUDS

Steel Valves	ASTM A193-79a	Grade 2H
Cast Iron Valves.....	AISI 12L14	Ledloy

CAP SCREWS

Cast Iron Valves.....	SAE J429	Grade 5
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MATERIAL	COMPONENT PARTS	COMPONENT USAGE		
St. Steel C316	Seat Rings	6"-12" E	ASTM A743-79	Grade CF-8
St. Steel C420	Seat Rings	Up to 5" E	ASTM A743-79	Grade CA-40
St. Steel	Seat Rings	C34, D34	ASTM A276-79a	AISI 303 & 304
St. Steel	Discs	Pilot	ASTM A276-79a	AISI 440C
St. Steel	Discs	6" & Up, includes parabolic	ASTM A276-79a	AISI303 & 304
St. Steel	Discs	Up to 5"	ASTMA582-79	AISI 420F
St. Steel	Stems	All Valves & Pilots	ASTM A276-79a	AISI 303
St. Steel	Stems	750°F E, Bot. GU. VAL.	ASTM A564-79	AISI 630 (17-4)
St. Steel	Diaphragms	All E's & Pilots	ASTM A167	AISI 301

PRESSURE PILOT DIAPHRAGMS

PART NO.	MATERIAL	SIZE	USED ON PILOT TYPE
4-01621-0	Brz.	3½"	W, A88, D2
4-01623-0	St. Stl.	3½"	D, N, Q, A43, A53
4-07890-0	Brz.	3½"	A35, A, A81, SP/P
4-01626-0	St. St.	3½"	P13, N4, F13, N24
4-01627-0	Brz.	4½"	A43, A84, A86, A93
4-01629-1	St. Stl.	4½"	P14, P110, Q43, F14
4-01630-0	Brz.	5¾"	A53, A5, P95, A85
4-01632-0	St. Stl.	5¾"	A92, P15, A54, F15
4-10721-0	Brz.	5¾"	D5, A35
4-03927-0	St. Stl.	5¾"	Q35, A81, A82
4-01633-0	Brz.	7¼"	A73, A70, A75, A87
4-01635-0	St. Stl.	7¼"	A73
4-09685-0	Brz	4½"	D120, A92, D234
4-01659-0	St. Stl.	4½"	A54, F46

TYPE E MAIN VALVE DIAPHRAGMS

VALVE SIZE	PART NO.		DIA.
	ST. STL.	BRZ.	
¾ & ½	4-01629-1	4-01627-0	4½
¾	4-01662-0	4-01660-0	5⅛
1	4-01632-0	4-01630-0	5¾
1¼	4-01664-0	4-09678-0	6½
1½	4-01635-0	4-01633-0	7¼
2	4-01638-0	4-09679-0	8⅛
2½	4-01641-0	4-09680-0	9
3	5-02038-0	4-09681-0	10
4	5-01647-0	4-09682-0	13
5	5-01649-0	4-09683-0	15
6	5-01651-0	5-09684-0	17½
8	5-01653-0	—	20
10	4-02096-0	—	25
12	5-01656-0	—	30

PRESSURE PILOT SPRINGS

PART NO.	DELIVERY PRESSURE	SPRING COLOR	WIRE DIAMETER	USED ON PILOT TYPE
5-05007-0	1 - 10	Aluminum	3/16"	D5
5-05007-0	3 - 20	Aluminum	3/16"	D, N, N33, Q, N20
5-05003-0	5 - 25	Orange	1/4"	D5
5-05016-0	5 - 25	Uncolored	7/32"	D120
5-05003-0	5 - 50	Orange	1/4"	D, N, N33, Q,
5-05028-0	10-75	Uncolored	5/16"	D120
5-05005-0	10 - 100	Green	5/16"	D, N, N33, Q, N20
5-05012-0	20 -150	Black	11/32"	D, N, N33, Q, N20
5-04990-0	100-300	Uncolored	7/16"	D2, N2, Q2
5-05030-0	40 - 150	Uncolored	3/8"	D120

The number of E Main Valve Diaphragms per set is as follows:

Initial Pressure	# per Set
10 - 250	2
250 - 400	3
400 - 600	4

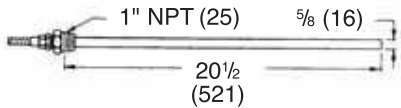
The Number of Diaphragms per set for Pilots varies with the type and delivery pressure. Consult factory.

PILOT ACCESSORIES

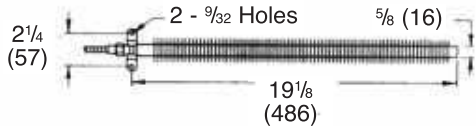
THERMOSTAT BULBS

FOR USE WITH T14, T124, T134, T52 PILOTS

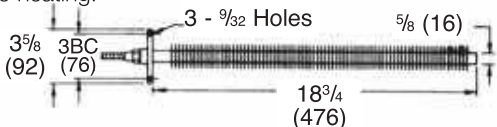
THERMOSTAT BULBS



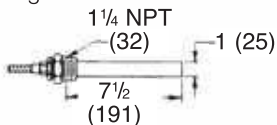
STYLE NO. 700—Plain Bulb with 1" Union Connection.



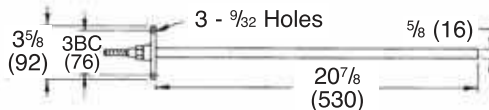
STYLE NO. 702—Finned Bulb with Wall Mounting Bracket. For space heating.



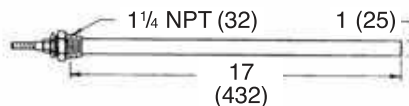
STYLE NO. 703—Finned Bulb with Duct Mounting Flange. For forced warm air heating.



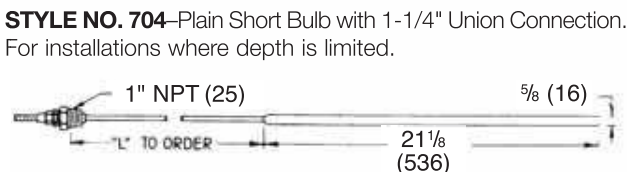
STYLE NO. 712—Plain Bulb with 1/4" OD Bendable Tubing Cover for Capillary. Used in open tanks or where a mounting connection is not required.



STYLE 713—Plain Bulb with Duct Mounting Flange. For forced warm air heating when dust is a problem.



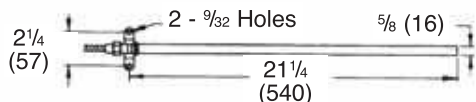
STYLE NO. 701—Large Plain Bulb with 1-1/4" Union Connection. Used on pilots having more than 30 feet of flexible tubing and with dial thermometer having 20 to 120°F range.



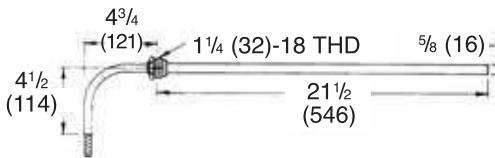
STYLE NO. 704—Plain Short Bulb with 1-1/4" Union Connection. For installations where depth is limited.



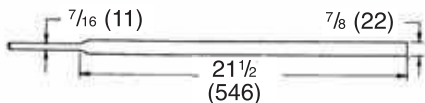
STYLE NO. 731—Plain Bulb with Adjustable Extension. Used in oil storage tanks or wherever it is desirable to change position of bulb. Dimension "E" must be specified.



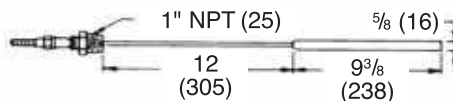
STYLE NO. 706—Plain Bulb with 1" Union Connection and 1/4" OD Bendable Extension. Dimension "L" must be specified.



STYLE NO. 740—Sanitary Bulb for Milk Heaters. Threaded to fit standard No. 23A Thermometer Ferrule. Stainless Steel Bulb and Flexible Tubing.

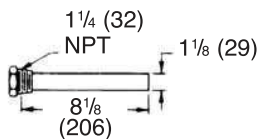


STYLE NO. 708—Plain Bulb with Wall Mounting Bracket. Used for space heating when dust is a problem.

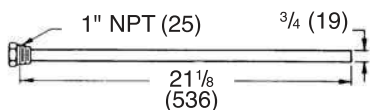


STYLE NO. 732—Special Bulb with 12" Adjustable Extension.

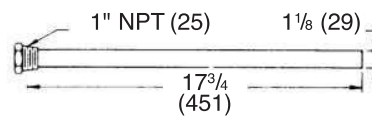
THERMOSTAT WELLS



727 WELL—Used with 704 Bulb



728 WELL—Used with 700 and 800 Bulb



729 WELL—Used with 701 and 801 Bulb

PILOT OPTIONS

DIAL THERMOMETER

Any Spence Temperature Pilot can be equipped with a Dial Thermometer. Pilots with Dial Thermometers are available in the 20-120°F, 70-170°F, 120-220°F and 170-270°F ranges.



DIAL THERMOMETER

SPRING CHAMBER

Spence Pressure Pilots can be provided with an enclosed spring chamber.

