TABLE OF CONTENTS

COMPONENTS - Circuit Setter Balancing

COMPONENTS - Automatic Balancing

Tunstall Corporation
118 Exchange Street • Chicopee, MA 01013
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TABLE OF CONTENTS (cont.)

COMPONENTS - Manual Balancing

COMPONENTS - Strainers

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TABLE OF CONTENTS (cont.)

COMPONENTS - Shut-Off Valves

COMPONENTS - Unions

COMPONENTS - Accessories

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TABLE OF CONTENTS (cont.)

COMPONENTS - Accessories (cont.)

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MACON® BALANCING

Model STV / STVL

Submittal Data

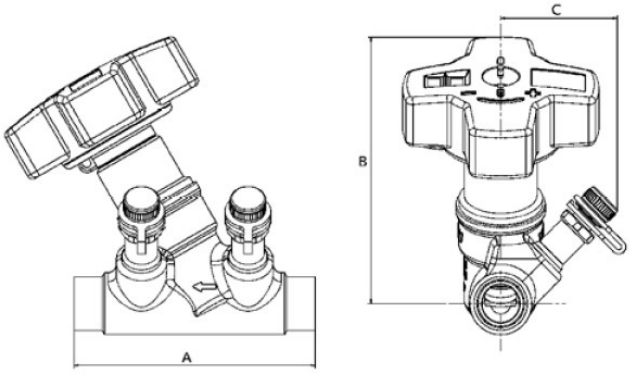
CIRCUIT SETTER

FEATURES

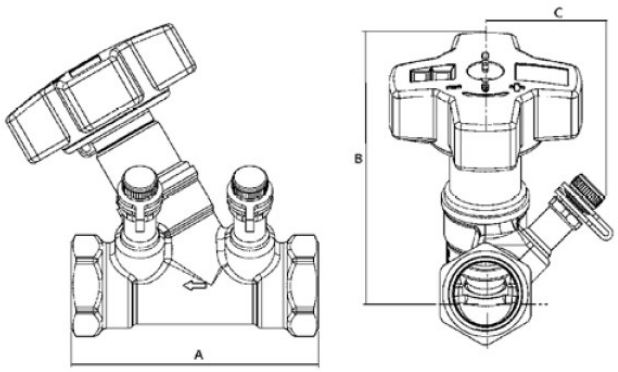
- Accurate and precise flow measurement
- Accurate and precise flow balancing
- Positive Shut-off
- Offsetting Pressure/temperature ports, Self sealing with optional Drain Kits
- "Y" Pattern Globe style design
- Multi-turn, 360º handwheel with vernier scale and digital readout
- Built in memory stop
- Wide vairety of accessories available

SPECIFICATIONS

Pressure Ratings:	300 psil (20 Bar)
Temperature Ratings:	-22ºF to 250ºF (-30ºC to 120ºC)
Body, Bonnet:	Dezincification Resistant Brass
End Connections:	STV - Female, NPT STVL - Solder, SWT
Gaskets:	EPDM
Seat Seal:	EPDM
Handwheel:	Polyamide Plastic



STVL Series



STV Series

NOMINAL DIMENSIONS & WEIGHTS									Valve Selection Guide			
SIZE			A Length	B Height	C PIT Offset	WEIGHT		Handwheel Turns		Minimum Flow	Nominal Range of Flow	Maximum Flow
in	mm					lbs	kg					
1/2"	15	in	3.39	3.74	1.57	1.2	0.53	10	**GPM**	**0.14**	**0.5 - 3.8**	**12.1**
		mm	86.11	95	40				LPM	0.52	1.89 - 14.36	45.7
3/4"	20	in	3.54	3.74	1.65	1.3	0.58	10	**GPM**	**0.26**	**3.8 - 5.5**	**17.4**
		mm	89.92	95	42				LPM	0.98	14.36 - 20.8	65.7
1"	25	in	4.02	3.78	1.73	1.7	0.77	10	**GPM**	**0.37**	**5.5 - 9.5**	**30.0**
		mm	102.11	96	44				LPM	1.38	20.8 - 36	113.4
1-1/4"	32	in	4.72	3.78	1.85	2.7	1.20	10	**GPM**	**0.60**	**9.5 - 14**	**44.6**
		mm	119.89	96	47				LPM	2.28	36 - 53	169.0
1-1/2"	40	in	5.20	4.25	1.93	3.3	1.50	10	**GPM**	**0.91**	**14 - 20**	**66.4**
		mm	132.08	108	49				LPM	3.46	53 - 76	251.0
2"	50	in	6.06/6.46 STV/STVL	4.37	2.09	5.1	2.30	10	**GPM**	**1.52**	**20 - 33**	**107.2**
		mm	154/164	111	53				LPM	5.76	76 - 125	406.0

FLOW CALCULATIONS
The Minimum Flow is calculated from the minimum recommended pressure drop, 1 ft WG (=3.0 kPa)
The Nominal Flow is from the maximum setting of the valve and the minimum recommended pressure drop, 2 ft WG (=6.0 kPa)
The Maximum Flow is calculated from the maximum setting of the valve and the max pressure drop, 20 ft WG (=60.0 kPa)

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

www.maconbalancing.com

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Pressure Drop Tables - *Series STV / STVL*

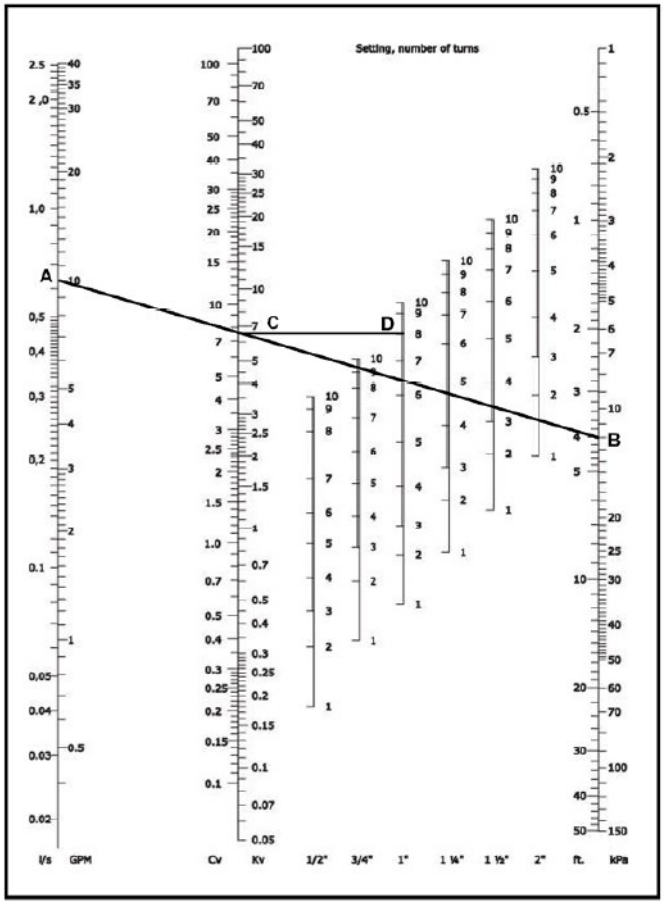
Series STV & STVL 1/2" - 2"

This diagram details the relationship between flow, pressure drop and valve preset points. Use the diagram to select the correct valve size and corresponding handwheel setting to fulfill the application requirements.

Determine the required flow in the circuit (A) and the pressure drop (B). Draw a line between these two values. Read off the corresponding Cv value on the Cv scale.

Determine the valve setting, in handwheel turns, by drawing a horizontal line (D) from the intersection point on the Cv scale to the corresponding valve setting position.

For the highest level of accuracy, it is recommended to choose a valve that has at least 3 open turns.



Cv Values for Valve Series STV / STVL

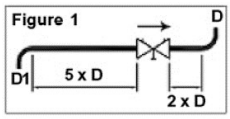
Flow coefficient values (CV's) at various handwheel settings						
Handwheel Setting	1/2" DN 15	3/4" DN 20	1" DN 25	1-1/4" DN 32	1-1/2" DN 40	2" DN 50
1	0.21	0.39	0.56	0.92	1.39	2.32
1.5	0.29	0.56	0.75	1.28	1.97	3.25
2	0.37	0.70	0.89	1.53	2.38	4.18
2.5	0.44	0.82	1.04	1.80	2.78	5.10
3	0.52	0.96	1.19	2.09	3.25	6.03
3.2	0.56	1.02	1.28	2.26	3.48	6.50
3.4	0.59	1.09	1.39	2.44	3.71	6.96
3.6	0.63	1.16	1.51	2.67	4.06	7.54
3.8	0.67	1.23	1.62	2.90	4.41	8.12
4	0.72	1.31	1.74	3.13	4.76	8.82
4.2	0.77	1.39	1.91	3.42	5.10	9.74
4.4	0.81	1.48	2.09	3.71	5.57	10.70
4.6	0.87	1.58	2.26	4.06	6.03	11.70
4.8	0.93	1.68	2.44	4.41	6.61	12.80
5	1.00	1.80	2.67	4.76	7.19	13.80
5.2	1.07	1.91	2.90	5.16	7.77	15.00
5.4	1.14	2.03	3.19	5.57	8.35	16.00
5.6	1.21	2.16	3.48	5.97	8.93	17.20
5.8	1.28	2.30	3.83	6.38	9.63	18.30
6	1.36	2.44	4.18	6.84	10.30	19.40
6.2	1.44	2.60	4.47	7.25	11.00	20.40
6.4	1.52	2.76	4.76	7.66	11.80	21.50
6.6	1.62	2.96	5.10	8.12	12.50	22.50
6.8	1.74	3.16	5.54	8.58	13.20	23.50
7	1.88	3.36	5.80	9.05	13.90	24.60
7.2	2.06	3.60	6.15	9.51	14.60	25.50
7.4	2.26	3.83	6.50	9.98	15.30	26.40
7.6	2.49	4.06	6.84	10.40	15.90	27.40
7.8	2.73	4.27	7.19	10.80	16.50	28.20
8	2.96	4.47	7.54	11.30	17.10	29.00
8.2	3.13	4.63	7.89	11.70	17.60	29.90
8.4	3.29	4.78	8.24	12.20	18.20	30.70
8.6	3.42	4.93	8.58	12.60	18.80	31.60
8.8	3.54	5.08	8.87	13.00	19.40	32.40
9	3.65	5.22	9.16	13.30	19.80	33.20
9.2	3.77	5.36	9.40	13.70	20.30	33.90
9.4	3.87	5.50	9.63	14.20	20.90	34.60
9.6	3.98	5.64	9.86	14.50	21.50	35.30
9.8	4.06	5.78	10.00	14.80	22.00	36.00
10	4.12*	5.92*	10.2*	15.2*	22.6*	36.5*

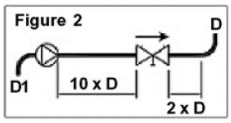
* Valve is fully open

Example: A 1" valve is required to be open 8 turns for a Cv value of 7.5 at a flow rate of 10 gpm and a pressure drop of 4ft.

Installation Recommendations

Install the valve in the correct flow direction according to the arrow on the valve body and the distance parameters detailed in Figure 1. (Note: D = pipe diameter).





For Series STVL, cover the valve body with a wet cloth when soldering to prevent premature deterioration of valve components.

When used with a pump, it is recommended to use a straight length of pipe totaling 10 x D (instead of 5 x D) upstream or downstream to avoid turbulence that will affect the measuring accuracy. See Figure 2.

Turbulence can influence the measurements by up to 20% if this recommendation is not followed.

Flow Measurement & Accuracy

The measuring instrument connects to the test ports of the valve and is pre-programmed with Macon Balancing characteristics. The pressure drop and flow readings can be read off the display. If access to a Macon Balancing instrument is unavailable, other industry models are compatible. In addition, the flow can be determined using the pressure drop diagram that is included in the operating instructions with each Macon Balancing valve.

The accuracy is highest when the valve is fully open. Therefore, it is recommended to choose a valve that can be opened at least three turns at the calculated pre-setting value. Figure 3 represents the flow measurement deviation in relation to handwheel turns.

Correction for Liquids

Applies to liquids other than water. Correct the measured flow (q) by the density (ϒ) according to this formula. See Figure 4.

Sizing a Balancing Valve

When the differential pressure and design flow are known, use this formula to calculate Cv value. See Figure 5.

Memory Stop

1. Set valves to desired position.
2. Turn the inner stem with a 3 mm Allen wrench in a clockwise direction until it stops.

Figure 3

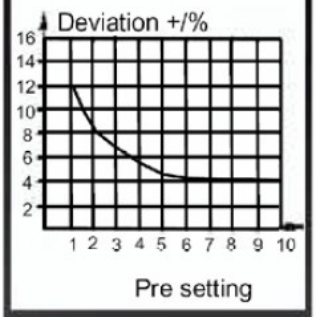


Figure 4

$$\textit{Actual Flow} = \frac{q_{CBI}}{\sqrt{\gamma}}$$

Figure 5

$$C_v = 1.52\,\frac{q}{\sqrt{\Delta p}}$$

q in GPM, Δ p in Ft. of H2O

$$C_v = \frac{q}{\sqrt{\Delta p}}$$

q in GPM, √ p in PSI

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

Tunstall Corporation
118 Exchange Street · Chicopee, MA 01013
Phone (413) 594-8695 · Fax (413) 598-8109

Model LL-STV / LL-STVL

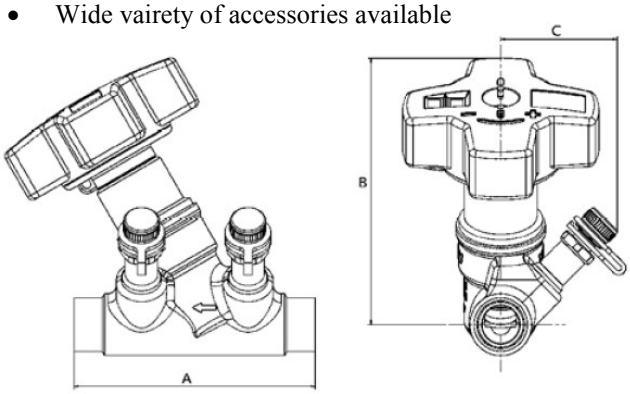
*(Low Lead)**
Submittal Data

FEATURES

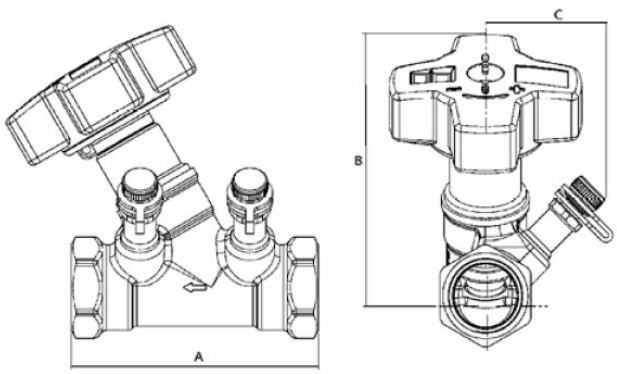
- Accurate and precise flow measurement
- Accurate and precise flow balancing
- Positive Shut-off
- Offsetting Pressure/temperature ports, Self sealing with optional Drain Kits
- "Y" Pattern Globe style design
- Multi-turn, 360º handwheel with vernier scale and digital readout
- Built in memory stop
- Wide vairety of accessories available

SPECIFICATIONS

Pressure Ratings:	300 psil (20 Bar)
Temperature Ratings:	-22ºF to 250ºF (-30ºC to 120ºC)
Body, Bonnet:	CW724R, CW511L
End Connections:	STV - Female, NPT STVL - Solder, SWT
Gaskets:	EPDM
Seat Seal:	EPDM
Handwheel:	Polyamide Plastic



LL-STVL Series



LL-STV Series

* The wetted surface of this product contacted by consumable water contains less than one quarter of one percent (0.25%) of lead by weight. Certificate of compliance available upon request.

NOMINAL DIMENSIONS & WEIGHTS									Valve Selection Guide			
SIZE			A Length	B Height	C PIT Offset	WEIGHT		Handwheel Turns		Minimum Flow	Nominal Range of Flow	Maximum Flow
in	mm					lbs	kg					
1/2"	15	in	3.39	3.74	1.57	1.2	0.53	10	**GPM**	**0.14**	**0.5 - 3.8**	**12.1**
		mm	86	95	40				LPM	0.52	1.89 - 14.36	45.7
3/4"	20	in	3.54	3.74	1.65	1.3	0.58	10	**GPM**	**0.26**	**3.8 - 5.5**	**17.4**
		mm	90	95	42				LPM	0.98	14.36 - 20.8	65.7
1"	25	in	4.02	3.78	1.73	1.7	0.77	10	**GPM**	**0.37**	**5.5 - 9.5**	**30.0**
		mm	102	96	44				LPM	1.38	20.8 - 36	113.4
1-1/4"	32	in	4.72	3.78	1.85	2.7	1.20	10	**GPM**	**0.60**	**9.5 - 14**	**44.6**
		mm	120	96	47				LPM	2.28	36 - 53	169.0
1-1/2"	40	in	5.20	4.25	1.93	3.3	1.50	10	**GPM**	**0.91**	**14 - 20**	**66.4**
		mm	132	108	49				LPM	3.46	53 - 76	251.0
2"	50	in	6.06/6.46 STV/STVL	4.37	2.09	5.1	2.30	10	**GPM**	**1.52**	**20 - 33**	**107.2**
		mm	154/164	111	53				LPM	5.76	76 - 125	406.0

FLOW CALCULATIONS
The Minimum Flow is calculated from the minimum recommended pressure drop, 1 ft WG (=3.0 kPa)
The Nominal Flow is from the maximum setting of the valve and the minimum recommended pressure drop, 2 ft WG (=6.0 kPa)
The Maximum Flow is calculated from the maximum setting of the valve and the max pressure drop, 20 ft WG (=60.0 kPa)

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

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Pressure Drop Tables - *Series LL-STV / LL-STVL*

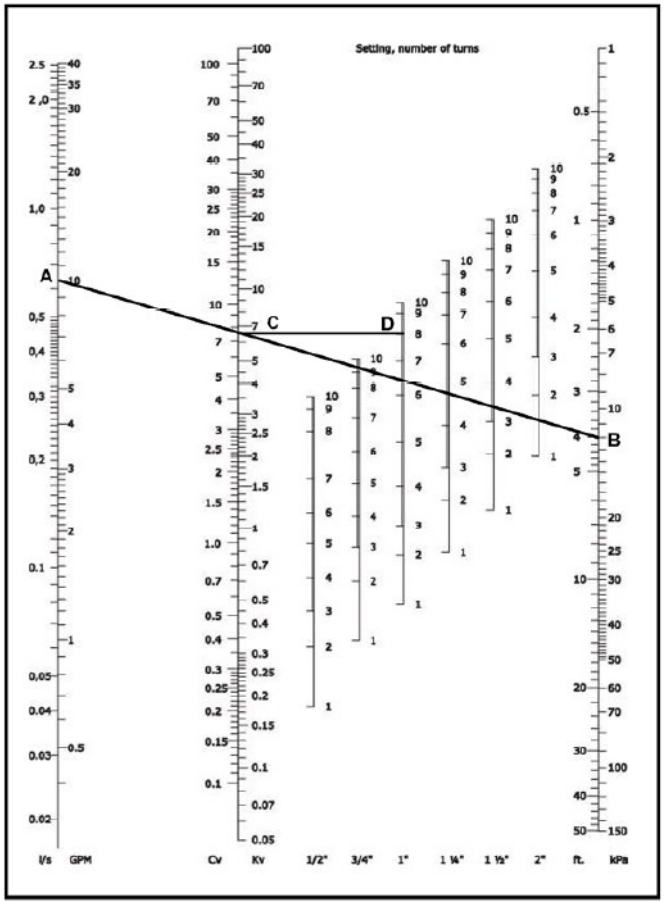
Series LL-STV & LL-STVL 1/2" - 2"

This diagram details the relationship between flow, pressure drop and valve preset points. Use the diagram to select the correct valve size and corresponding handwheel setting to fulfill the application requirements.

Determine the required flow in the circuit (A) and the pressure drop (B). Draw a line between these two values. Read off the corresponding Cv value on the Cv scale.

Determine the valve setting, in handwheel turns, by drawing a horizontal line (D) from the intersection point on the Cv scale to the corresponding valve setting position.

For the highest level of accuracy, it is recommended to choose a valve that has at least 3 open turns.



Cv Values for Valve Series LL-STV / LL-STVL

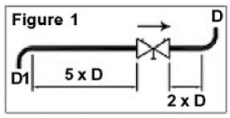
Flow coefficient values (CV's) at various handwheel settings						
Handwheel Setting	1/2" DN 15	3/4" DN 20	1" DN 25	1-1/4" DN 32	1-1/2" DN 40	2" DN 50
1	0.21	0.39	0.56	0.92	1.39	2.32
1.5	0.29	0.56	0.75	1.28	1.97	3.25
2	0.37	0.70	0.89	1.53	2.38	4.18
2.5	0.44	0.82	1.04	1.80	2.78	5.10
3	0.52	0.96	1.19	2.09	3.25	6.03
3.2	0.56	1.02	1.28	2.26	3.48	6.50
3.4	0.59	1.09	1.39	2.44	3.71	6.96
3.6	0.63	1.16	1.51	2.67	4.06	7.54
3.8	0.67	1.23	1.62	2.90	4.41	8.12
4	0.72	1.31	1.74	3.13	4.76	8.82
4.2	0.77	1.39	1.91	3.42	5.10	9.74
4.4	0.81	1.48	2.09	3.71	5.57	10.70
4.6	0.87	1.58	2.26	4.06	6.03	11.70
4.8	0.93	1.68	2.44	4.41	6.61	12.80
5	1.00	1.80	2.67	4.76	7.19	13.80
5.2	1.07	1.91	2.90	5.16	7.77	15.00
5.4	1.14	2.03	3.19	5.57	8.35	16.00
5.6	1.21	2.16	3.48	5.97	8.93	17.20
5.8	1.28	2.30	3.83	6.38	9.63	18.30
6	1.36	2.44	4.18	6.84	10.30	19.40
6.2	1.44	2.60	4.47	7.25	11.00	20.40
6.4	1.52	2.76	4.76	7.66	11.80	21.50
6.6	1.62	2.96	5.10	8.12	12.50	22.50
6.8	1.74	3.16	5.54	8.58	13.20	23.50
7	1.88	3.36	5.80	9.05	13.90	24.60
7.2	2.06	3.60	6.15	9.51	14.60	25.50
7.4	2.26	3.83	6.50	9.98	15.30	26.40
7.6	2.49	4.06	6.84	10.40	15.90	27.40
7.8	2.73	4.27	7.19	10.80	16.50	28.20
8	2.96	4.47	7.54	11.30	17.10	29.00
8.2	3.13	4.63	7.89	11.70	17.60	29.90
8.4	3.29	4.78	8.24	12.20	18.20	30.70
8.6	3.42	4.93	8.58	12.60	18.80	31.60
8.8	3.54	5.08	8.87	13.00	19.40	32.40
9	3.65	5.22	9.16	13.30	19.80	33.20
9.2	3.77	5.36	9.40	13.70	20.30	33.90
9.4	3.87	5.50	9.63	14.20	20.90	34.60
9.6	3.98	5.64	9.86	14.50	21.50	35.30
9.8	4.06	5.78	10.00	14.80	22.00	36.00
10	4.12*	5.92*	10.2*	15.2*	22.6*	36.5*

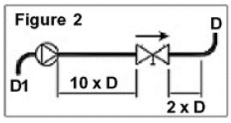
* Valve is fully open

Example: A 1" valve is required to be open 8 turns for a Cv value of 7.5 at a flow rate of 10 gpm and a pressure drop of 4ft.

Installation Recommendations

Install the valve in the correct flow direction according to the arrow on the valve body and the distance parameters detailed in Figure 1.





(Note: D = pipe diameter).
For Series LL-STVL, cover the valve body with a wet cloth when soldering to prevent premature deterioration of valve components.

When used with a pump, it is recommended to use a straight length of pipe totaling 10 x D (instead of 5 x D) upstream or downstream to avoid turbulence that will affect the measuring accuracy. See Figure 2.

Turbulence can influence the measurements by up to 20% if this recommendation is not followed.

Flow Measurement & Accuracy

The measuring instrument connects to the test ports of the valve and is pre-programmed with Macon Balancing characteristics. The pressure drop and flow readings can be read off the display. If access to a Macon Balancing instrument is unavailable, other industry models are compatible. In addition, the flow can be determined using the pressure drop diagram that is included in the operating instructions with each Macon Balancing valve.

The accuracy is highest when the valve is fully open. Therefore, it is recommended to choose a valve that can be opened at least three turns at the calculated pre-setting value. Figure 3 represents the flow measurement deviation in relation to handwheel turns.

Correction for Liquids

Applies to liquids other than water. Correct the measured flow (q) by the density (ϒ) according to this formula. See Figure 4.

Sizing a Balancing Valve

When the differential pressure and design flow are known, use this formula to calculate Cv value. See Figure 5.

Memory Stop

1. Set valves to desired position.
2. Turn the inner stem with a 3 mm Allen wrench in a clockwise direction until it stops.

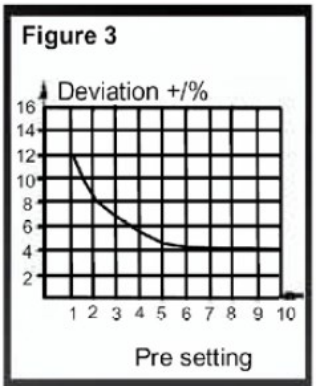


Figure 4

$$\textit{Actual Flow} = \frac{q_{CBI}}{\sqrt{\gamma}}$$

Figure 5

$$C_v = 1.52 \frac{q}{\sqrt{\Delta p}}$$

q in GPM, Δ p in Ft. of H2O

$$C_v = \frac{q}{\sqrt{\Delta p}}$$

q in GPM, √ p in PSI

Tunstall Corporation
118 Exchange Street · Chicopee, MA 01013
Phone (413) 594-8695 · Fax (413) 598-8109

MACON® BALANCING

Model STVA

2-1/2" to 6"

Submittal Data

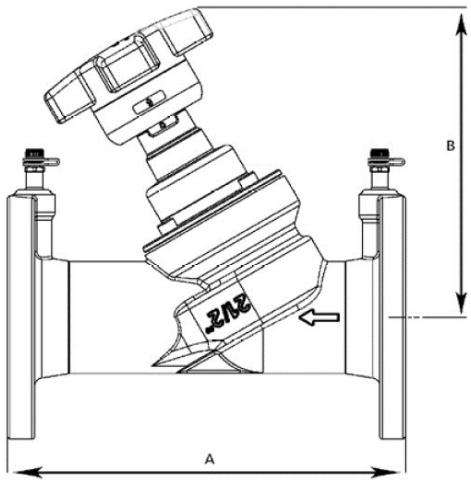
CIRCUIT SETTER

FEATURES

- Accurate and precise flow measurement
- Accurate and precise flow balancing
- Positive shut-off
- "Y" Pattern Globe style design
- Multi-turn, 360º handwheel with vernier scale and digital readout
- Built in memory stop
- Offsetting Pressure/Temperature ports, Self sealing with optional Drain Kits
- Wide vairety of accessories available

SPECIFICATIONS

Pressure Ratings:	235 psi / 16 bar (PN 16)
Temperature Ratings:	-14ºF to 250ºF (-25ºC to 120ºC)
Body:	Cast Iron
End Connections:	AMSI 125# Flanged
Gaskets:	EPDM
Seat Seal:	PTFE
Handwheel:	Polyamide Plastic



NOMINAL DIMENSIONS & WEIGHTS								Valve Selection Guide			
SIZE			A Length	B Height	WEIGHT		Handwheel Turns		Minimum Flow	Nominal Range of Flow	Maximum Flow
in	mm				lbs	kg					
2-1/2"	65	in	11.42	8.94	30.9	14	10	**GPM**	**2.13**	**33 - 100**	**318.3**
		mm	290	226				LPM	8.07	125 - 378	1205
3"	80	in	12.2	9.5	44.1	20	10	**GPM**	**4.19**	**100 - 117**	**374.5**
		mm	310	241				LPM	15.9	378 - 442	1418
4"	100	in	13.78	10.2	57.3	26	10	**GPM**	**6.09**	**117 - 200**	**646.8**
		mm	350	259				LPM	23.0	442 - 756	2448
5"	125	in	15.75	11.73	88.2	40	10	**GPM**	**7.61**	**200 - 320**	**1025**
		mm	400	298				LPM	28.8	756 - 1210	3879
6"	150	in	18.9	12.05	110.2	50	10	**GPM**	**13.7**	**320 - 440**	**1447**
		mm	480	306				LPM	51.9	1210 - 1663	5477

FLOW CALCULATIONS

The Minimum Flow is calculated from the minimum recommended pressure drop, 1 ft WG (=3.0 kPa)

The Nominal Flow is calculated from the maximum setting of the valve and the minimum recommended pressure drop, 2 ft WG (=6.0 kPa)

The Maximum Flow is calculated from the maximum setting of the valve and the maximum pressure drop, 20 ft WG (=60.0 kPa)

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

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118 Exchange Street · Chicopee, MA 01013
Phone (413) 594-8695 · Fax (413) 598-8109

Pressure Drop Tables - *Model STVA - 2-1/2" to 6"*

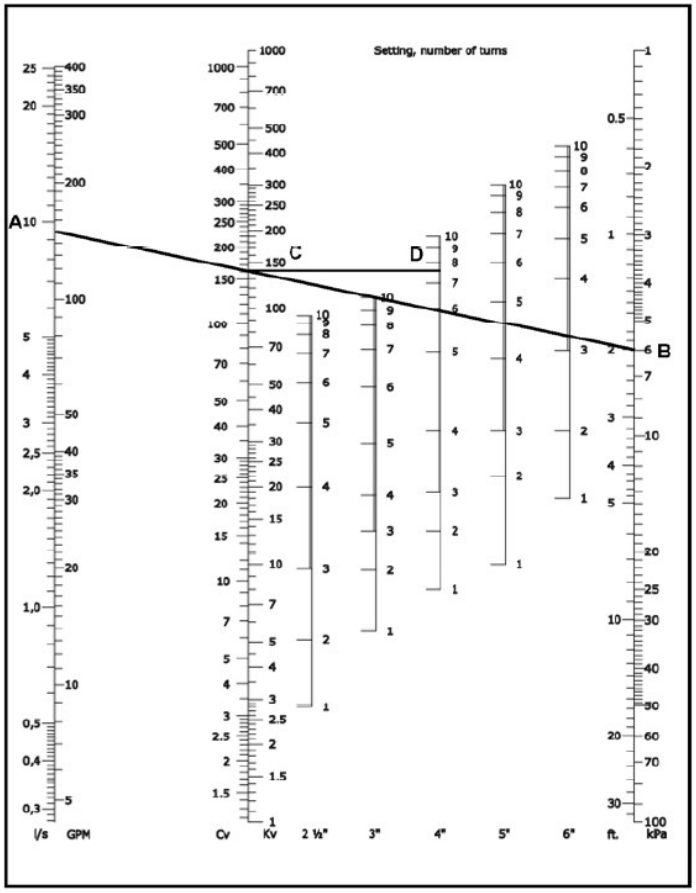
Series STVA 2-1/2" - 6"

This diagram details the relationship between flow, pressure drop and valve preset points. Use the diagram to select the correct valve size and corresponding handwheel setting to fulfill the application requirements.

Determine the required flow in the circuit (A) and the pressure drop (B). Draw a line between these two values. Read off the corresponding Cv value on the Cv scale.

Determine the valve setting, in handwheel turns, by drawing a horizontal line (D) from the intersection point on the Cv scale to the corresponding valve setting position.

For the highest level of accuracy, it is recommended to choose a valve that has at least 3 open turns.



Cv Values for Valve Series STVA

Flow coefficient values (CV's) at various handwheel settings

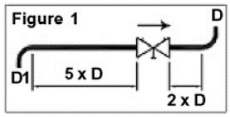
Handwheel Setting	2-1/2" DN 65	3" DN 80	4" DN 100	5" DN 125	6" DN 150
1	3.20	6.40	9.30	11.60	20.90
1.5	4.60	8.70	12.80	19.70	29.00
2	5.90	11.00	15.70	25.50	38.30
2.5	8.50	13.30	19.10	30.20	53.40
3	11.10	15.70	22.00	38.30	78.90
3.2	13.10	16.60	23.80	42.90	90.50
3.4	15.10	17.50	25.50	48.70	103
3.6	17.40	18.60	29.00	55.70	118
3.8	20.30	19.70	33.60	63.80	135
4	23.20	21.50	38.30	73.10	151
4.2	26.80	23.20	45.20	82.40	164
4.4	30.40	24.90	53.40	91.60	176
4.6	34.00	27.30	61.50	102	189
4.8	37.60	30.70	69.60	113	202
5	41.20	34.20	77.70	123	216
5.2	44.80	38.30	85.80	135	231
5.4	48.40	42.90	94.00	146	246
5.6	52.00	47.60	102	157	260
5.8	55.60	52.20	109	166	273
6	59.20	56.80	115	174	285
6.2	62.60	61.50	122	183	298
6.4	66.10	66.10	129	194	311
6.6	69.60	70.80	135	204	322
6.8	73.10	75.40	140	215	332
7	76.60	79.50	145	225	341
7.2	80.00	83.50	151	235	351
7.4	82.90	87.60	157	246	363
7.6	85.80	91.60	162	255	374
7.8	88.70	95.10	168	264	384
8	91.10	98.60	174	274	394
8.2	93.40	102	180	283	406
8.4	95.70	105	186	292	418
8.6	97.40	108	190	302	428
8.8	99.20	111	194	310	437
9	101	114	197	317	447
9.2	103	116	202	324	456
9.4	104	119	206	331	465
9.6	106	123	211	338	474
9.8	107	125	216	343	484
10	108*	128*	220*	349*	493*

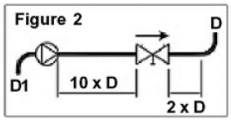
* Valve is fully open

Example: A 4" valve is required to be open 7.5 turns for a Cv value of 160 at a flow rate of 150 gpm and a pressure drop of 2ft.

Installation Recommendations

Install the valve in the correct flow direction according to the arrow on the valve body and the distance parameters detailed in Figure 1 (Note: D = pipe diameter).





For Series STVA, cover the valve body with a wet cloth when soldering to prevent premature deterioration of valve components.

When used with a pump, it is recommended to use a straight length of pipe totaling 10 x D (instead of 5 x D) upstream or downstream to avoid turbulence that will affect the measuring accuracy. See Figure 2.

Turbulence can influence the measurements by up to 20% if this recommendation is not followed.

Flow Measurement & Accuracy

The measuring instrument connects to the test ports of the valve and is pre-programmed with Macon Balancing characteristics. The pressure drop and flow readings can be read off the display. If access to a Macon Balancing instrument is unavailable, other industry models are compatible. In addition, the flow can be determined using the pressure drop diagram that is included in the operating instructions with each Macon Balancing valve.

The accuracy is highest when the valve is fully open. Therefore, it is recommended to choose a valve that can be opened at least three turns at the calculated pre-setting value. Figure 3 represents the flow measurement deviation in relation to handwheel turns.

Correction for Liquids

Applies to liquids other than water. Correct the measured flow (q) by the density (γ) according to this formula. See Figure 4

Sizing a Balancing Valve

When the differential pressure and design flow are known, use this formula to calculate Cv value. See Figure 5

Figure 3

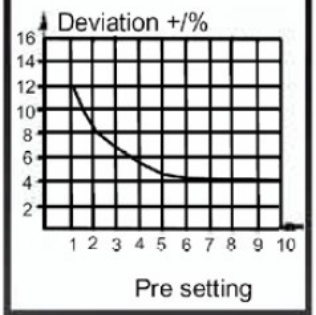


Figure 4

$$\textit{Actual Flow} = \frac{q_{CBI}}{\sqrt{\gamma}}$$

Figure 5

$$C_v = 1.52 \frac{q}{\sqrt{\Delta p}}$$

q in GPM, Δ p in Ft. of H2O

$$C_v = \frac{q}{\sqrt{\Delta p}}$$

q in GPM, √ p in PSI

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

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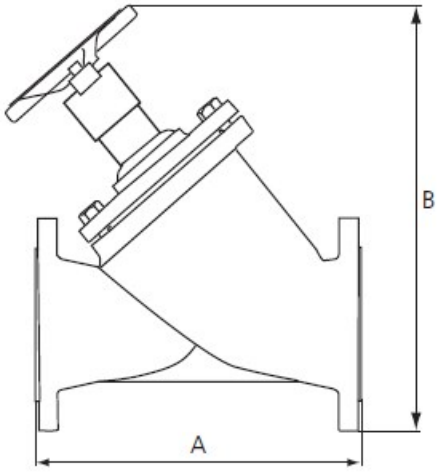
FEATURES

- Accurate and precise flow measurement
- Accurate and precise flow balancing
- Positive shut-off
- "Y" Pattern Globe style design
- Multi-turn, 360º handwheel with vernier scale and digital readout
- Built in memory stop
- Offsetting Pressure/Temperature ports, self sealing with optional Drain Kits
- Wide variety of accessories available

SPECIFICATIONS

Pressure Ratings:	250 psi / 16 bar (PN 16)
Temperature Ratings:	-14ºF to 250ºF (-10ºC to 120ºC)
Body:	Cast Iron
End Connections:	ANSI 125# Flanged
Gaskets:	EPDM
Seat Seal:	PTFE



NOMINAL DIMENSIONS & WEIGHTS								Valve Selection Guide			
SIZE			A Length	B Height	WEIGHT		Handwheel Turns		Minimum Flow	Nominal Range of Flow	Maximum Flow
in	mm				lbs	kg					
8"	200	in	23.6	13.5	260	118	11	**GPM**	**30**	**450 - 750**	**2415**
		mm	600	343				LPM	114	1703 - 2839	9142
10"	250	in	28.7	16.0	390	177	11	**GPM**	**47**	**750 - 1300**	**4050**
		mm	730	406				LPM	178	2839 - 4921	15330
12"	300	in	33.5	19.0	490	223	11	**GPM**	**43**	**1300 - 1600**	**5115**
		mm	850	483				LPM	163	4921 - 6057	19360

FLOW CALCULATIONS
The Minimum Flow is calculated from the minimum recommended pressure drop, 1 ft WG (=3.0 kPa)
The Nominal Flow is calculated from the maximum setting of the valve and the minimum recommended pressure drop, 2 ft WG (=6.0 kPa)
The Maximum Flow is calculated from the maximum setting of the valve and the maximum pressure drop, 20 ft WG (=60.0 kPa)

Pressure Drop Tables - *Model STVE—Sizes 8" to 12"*

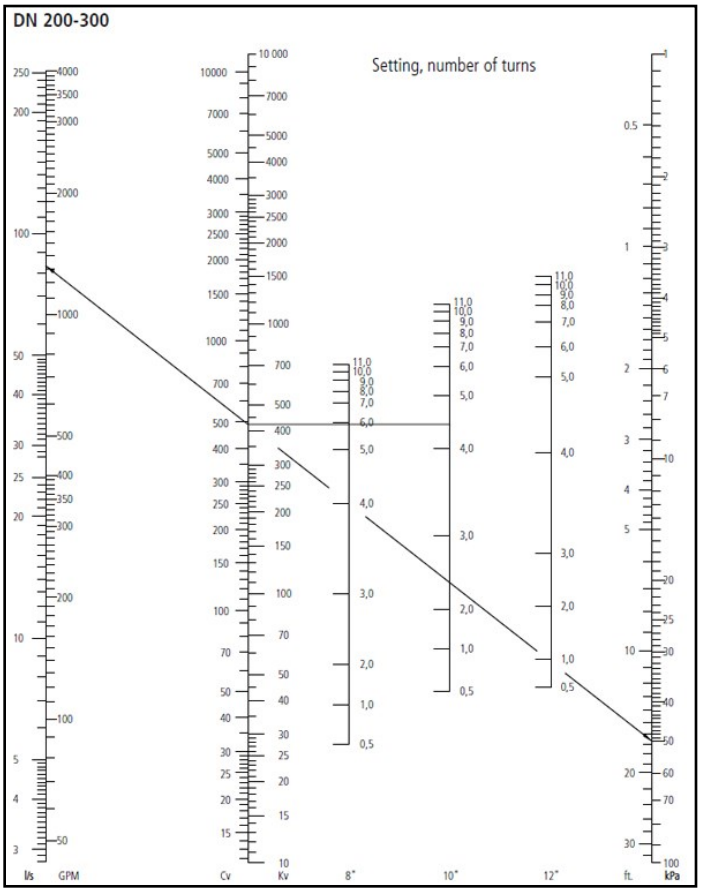
Series STVE 8" - 12"

This diagram details the relationship between flow, pressure drop and valve preset points. Use the diagram to select the correct valve size and corresponding handwheel setting to fulfill the application requirements.

Determine the required flow in the circuit (A) and the pressure drop (B). Draw a line between these two values. Read off the corresponding Cv value on the Cv scale (C).

Determine the valve setting, in handwheel turns, by drawing a horizontal line (D) from the intersection point on the Cv scale to the corresponding valve setting position.

For the highest level of accuracy, it is recommended to choose a valve that has at least 3 open turns.



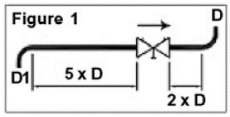
Cv Values for Valve Series STVE

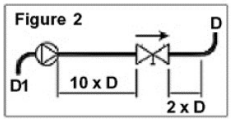
Flow coefficient values (CV's) at various handwheel settings			
Handwheel Setting	**8" DN 200**	**10" DN 250**	**12" DN 300**
0.5	32	50	52
1	45	72	66
1.5	53	85	83
2	63	101	104
2.5	82	134	127
3	115	189	163
3.5	172	277	234
4	250	399	383
4.5	328	522	578
5	394	628	733
5.5	448	719	848
6	497	802	954
6.5	545	881	1067
7	587	952	1177
7.5	619	1013	1272
8	648	1070	1352
8.5	682	1126	1422
9	716	1182	1486
9.5	745	1234	1549
10	771	1283	1612
10.5	796	1330	1675
11	821	1373	1739

Example: A 10" valve is required to be open 4.3 turns for a Cv value of 500 at a flow rate of 1300 gpm and a pressure drop of 17 ft.

Installation Recommendations

Install the valve in the correct flow direction according to the arrow on the valve body and the distance parameters detailed in Figure 1 (Note: D = pipe diameter).
When used with a pump, it is recommended to use a straight length of pipe totaling 10 x D (instead of 5 x D) upstream or downstream to avoid turbulence that will affect the measuring accuracy. See Figure 2.





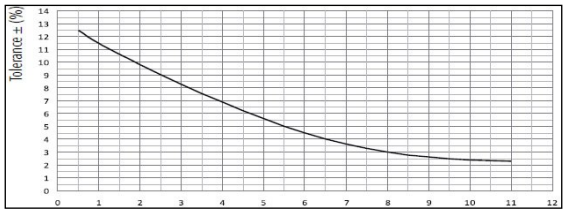
Turbulence can influence the measurements by up to 20% if this recommendation is not followed.

Flow Measurement & Accuracy

The measuring instrument connects to the test ports of the valve and is pre-programmed with Macon Balancing characteristics. The pressure drop and flow readings can be read off the display. If access to a Macon Balancing instrument is unavailable, other industry models are compatible. In addition, the flow can be determined using the pressure drop diagram that is included in the operating instructions with each Macon Balancing valve.

The accuracy is highest when the valve is fully open. Therefore, it is recommended to choose a valve that can be opened at least three turns at the calculated pre-setting value. Figure 3 represents the flow measurement deviation in relation to handwheel turns.

Figure 3



Correction for Liquids

Applies to liquids other than water. Correct the measured flow (q) by the density (Y) according to this formula. See Figure 4

Sizing a Balancing Valve

When the differential pressure and design flow are known, use this formula to calculate Cv value. See Figure 5

Figure 4

$$\text{Actual Flow} = \frac{q_{CBI}}{\sqrt{\gamma}}$$

Figure 5

$$C_v = 1.52 \frac{q}{\sqrt{\Delta p}}$$

q in GPM, Δ p in Ft. of H2O

$$C_v = \frac{q}{\sqrt{\Delta p}}$$

q in GPM, √ p in PSI

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

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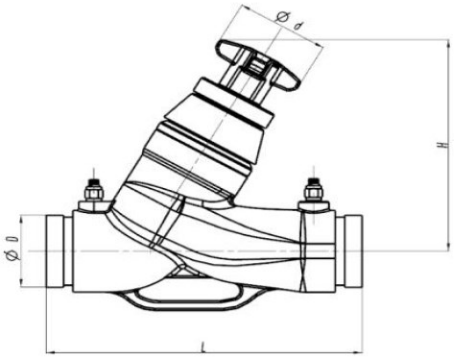
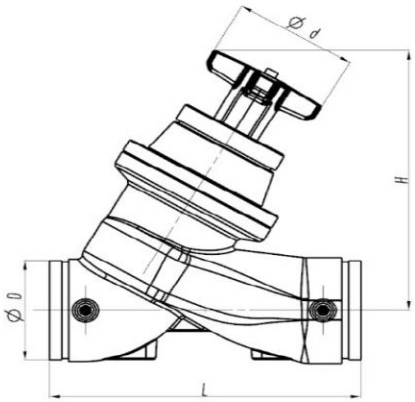
FEATURES
- Accurate and precise flow measurement
- Accurate and precise flow balancing
- Positive shut-off
- "Y" Pattern Globe style design
- Multi-turn, 360º handwheel Built in memory stop

SPECIFICATIONS

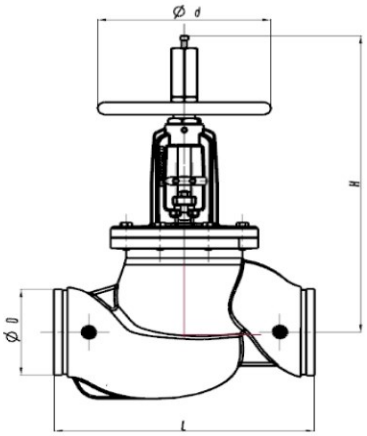
Pressure Ratings:	235 psi / 16 bar (PN 16)
Temperature Ratings:	-14ºF to 250ºF (-25ºC to 120ºC)
Body:	Ductile Iron
End Connections:	300# Grooved
Stem:	Stainless Steel (AISI 420)
Seat Seal:	EPDM Perox
Handwheel:	1-1/2" to 6", Polyamide Plastic with 30% Glass Fiber; 8" to 12", Ductile Iron



2-1/2" to 4" (DN 40 to 100)



5" & 6" (DN 125 to 150)



8" to 12" (DN 200 to 300)

NOMINAL DIMENSIONS & WEIGHTS

SIZE				L	H	D	Handwheel Diameter d	WEIGHT		Handwheel Turns
in	mm	Connection						lbs	kg	
2-1/2"	DN 65	Groove	in	11.42	8.50	2.875	3.35	23.8	10.8	8
			mm	290	216	73.0	85			
3"	DN 80	Groove	in	12.20	8.86	3.500	3.35	33	15	8
			mm	310	225	88.9	85			
4"	DN 100	Groove	in	13.78	13.19	4.500	3.35	60.3	27.4	8
			mm	350	335	114.3	85			
5"	DN 125	Groove	in	15.75	14.57	5.563	6.18	103.8	47.2	10
			mm	400	370	141.3	157			
6"	DN 150	Groove	in	18.90	15.98	6.625	6.18	143.2	65.1	10
			mm	480	406	168.3	157			
8"	DN 200	Groove	in	23.62	30.04	8.625	15.75	363	165	12
			mm	600	763	219.1	400			
10"	DN 250	Groove	in	28.74	35.12	10.750	15.75	506	230	12
			mm	730	892	273.0	400			
12"	DN 300	Groove	in	33.46	37.24	12.750	15.75	638	290	14
			mm	850	946	323.9	400			

Flow Coefficient Values - *Model STVG*

Flow coefficient values (Cv's) at various handwheel settings								
Handwheel Setting	2-1/2" DN 65	3" DN 80	4" DN 100	5" DN 125	6" DN 150	8" DN 200	10" DN 250	12" DN 300
1.00	8	17	24	81	52	126	250	298
1.25	10	20	27	97	56	162	303	346
1.50	12	22	29	113	59	198	354	452
1.75	15	25	32	129	62	233	399	448
2.00	19	27	35	143	66	274	444	499
2.25	24	30	38	158	70	316	480	553
2.50	30	33	31	171	74	360	513	618
2.75	36	36	48	184	78	401	543	682
3.00	42	40	55	197	81	437	574	750
3.25	47	45	64	209	84	466	605	819
3.50	53	51	73	223	87	488	635	887
3.75	57	58	84	235	92	508	668	946
4.00	62	64	95	247	99	528	697	995
4.25	66	71	106	259	111	547	722	1025
4.50	70	77	116	271	124	569	745	1045
4.75	74	84	127	282	138	589	764	1064
5.00	77	90	137	294	150	610	780	1091
5.25	80	97	147	305	158	631	792	1131
5.50	82	104	157	317	164	650	802	1183
5.75	84	110	167	327	169	667	810	1231
6.00	85	115	177	338	175	682	817	1273
6.25	87	121	188	347	183	692	825	1303
6.50	88	125	197	355	194	700	833	1320
6.75	89	128	206	362	211	707	839	1332
7.00	89	131	213	368	233	716	846	1343
7.25	90	133	219	374	261	727	852	1356
7.50	91	134	223	379	292	740	858	1371
7.75	92	135	226	384	323	754	864	1384
8.00	93	136	229	390	349	767	872	1395
8.25				396	369	780	881	1400
8.50				403	382	791	892	1404
8.75				410	394	799	901	1412
9.00				415	408	802	908	1430
9.25				418	424	801	912	1457
9.50				419	444	798	915	1491
9.75				419	466	795	917	1526
10.00				419	489	796	922	1554
10.25						803	929	1567
10.50						813	939	1570
10.75						824	949	1568
11.00						834	960	1565
11.25						840	969	1565
11.50						842	976	1567
11.75						843	983	1571
12.00						843	989	1575
12.25								1578
12.50								1581
12.75								1584
13.00								1588
13.25								1592
13.50								1598
13.75								1605
14.00								1611

Valve is fully open

Valve Selection Guide			
Valve Size Nominal Dimensions		Nominal Range of Flow	
Inches	MM	GPM	(LPH)
2-1/2	DN 65	39 - 87	(9k - 20k)
3	DN 80	87 - 125	(20k - 28k)
4	DN 100	125 - 213	(28k - 48k)
5	DN 125	213 - 300	(48k - 68k)
6	DN 150	300 - 450	(68k - 102k)
8	DN 200	450 - 760	(102k - 173k)
10	DN 250	760 - 920	(173k - 209k)
12	DN 300	920 - 1500	(209k - 341k)

Correction for Liquids

Applies to liquids other than water. Correct the measured flow (q) by the density (γ) according to this formula. See Figure 4

Sizing a Balancing Valve

When the differential pressure and design flow are known, use this formula to calculate Cv value. See Figure 5

Figure 4

$$\text{Actual Flow} = \frac{q_{CBI}}{\sqrt{\gamma}}$$

Figure 5

$$C_v = 1.52 \frac{q}{\sqrt{\Delta p}}$$

q in GPM, Δ p in Ft. of H2O

$$C_v = \frac{q}{\sqrt{\Delta p}}$$

q in GPM, √ p in PSI

Installation Recommendations for GROOVED END VALVE CONNECTIONS

Grease the pipe ends, valve ends and rubber gasket lip with grease, graphite paste or similar grease. Slip the rubber gasket over the pipe end of each joint. Slide the gasket past the grooves. Position the grooved end valve between the pipe ends and slide the gaskets back into the central spanned position.

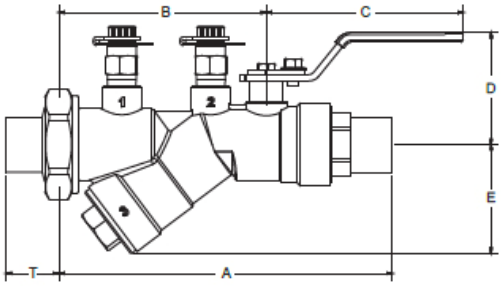
All products have a flow direction arrow. Make sure that it is pointing in the direction of the flow. Apply grease on the outside of the gasket. Install housing clamps over the gasket - insert bolts and nuts.

Tighten nuts evenly, using socket or other wrench. Tighten so that housing clamps come together evenly. The connection is complete when housing clamps meet metal to metal. Further tightening of bolts is not necessary.

Pre-assemble large diameter multi-segment housing clamps loosely and install them as half-housings. Take up evenly from top to bottom on alternate bolts.

Model AB
Submittal Data

Model AB Automatic Balancing Valve is a combination ball valve, automatic flow control device and union. The removable flow cartridge is factory set to automatically limit the GPM to within +5% of the specified flow. The ball valve has a chrome plated ball, Teflon seats and a blowout proof stem with double EPDM O-ring seals. The union has an EPDM O-ring seal and tail-piece available in MNPT, FNPT, and SWT end connections. Standard features include Memory Stop and Dual Pressure / Temperature Ports.



SPECIFICATIONS

Pressure Ratings:		600 PSI (4140 kPa)
Temperature Ratings:		250ºF (121ºC)
Accuracy:		± 5% of flow rate
Body Material:		Forged Brass
End Connections:		Brass - Fixed End: SWT, FNPT Union End: SWT, FNPT & MNPT
Flow Cartridge:	AB1e - AB3	Ultrason® Composite
	AB4	Stainless Steel
Seals:		EPDM
Ball:		Chrome Plated Brass, full port, 100% positive shut-off. *Optional 316 Stainless Steel.*
Stem:		Brass. *Optional 316 Stainless Steel.*
Handle:		Full size Zinc Plated lever with Vinyl Grip
Available Options:		"PTV" combination PT & Air Vent, hose end Drain Valve & Extensions

NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A		B	C	D	E	*T	Flow	WEIGHT	
	in	mm		FNPT	SWT					SWT	Range	lbs	kg
AB1e-050	1/2"	15	in	5.28	5.64	3.59	1.97	1.61	1.91	0.83	0.35 to 5.0 GPM	1.78	0.81
			mm	134.10	143.30	91.20	50.10	40.90	48.50	21.08			
AB1e-075	3/4"	20	in	5.41	5.92	3.59	1.97	1.61	1.91	0.83		1.83	0.83
			mm	137.40	150.40	91.20	50.10	40.90	48.50	21.08			
AB1e-100	1"	25	in	5.75	6.21	3.59	1.97	1.61	1.91	0.83		1.97	0.89
			mm	146.10	157.70	91.20	50.10	40.90	48.50	21.08			
AB2e-050	1/2"	15	in	5.71	5.95	3.86	3.66	2.08	2.02	0.83	0.35 to 10.0 GPM	2.09	0.95
			mm	145.16	151.16	98.04	92.99	52.83	51.33	21.08			
AB2e-075	3/4"	20	in	5.74	6.20	3.86	3.66	2.08	2.02	0.98		2.09	0.95
			mm	146.02	157.48	98.04	92.99	52.83	51.33	24.89			
AV2e-100	1"	25	in	5.96	6.36	3.86	3.66	2.08	2.02	0.98		5.05	2.29
			mm	151.51	161.54	98.04	92.99	52.83	51.33	24.89			
AV2e-125	1-1/4"	32	in	6.14	6.69	3.86	3.66	2.08	2.02	1.50		5.05	2.29
			mm	155.96	169.93	98.04	92.99	52.83	51.33	38.10			
AB3-100	1"	25	in	6.98	7.18	5.38	5.03	2.44	3.61	1.41	5.0 to 21.0 GPM	5.05	2.29
			mm	177.29	182.37	136.65	127.76	61.98	91.69	35.81			
AB3-125	1-1/4"	32	in	7.06	7.24	5.38	5.03	2.44	3.61	1.43		5.17	2.35
			mm	179.32	183.90	136.65	127.76	61.98	91.69	36.32			
AB3-150	1-1/2"	40	in	7.06	7.37	5.38	5.03	2.44	3.61	1.17		5.17	2.35
			mm	179.32	187.20	136.65	127.76	61.98	91.69	29.72			
AB4-150	1-1/2"	40	in	9.59	9.91	7.44	5.66	2.83	3.91	1.17	11.0 to 70.0 GPM	8.63	3.91
			mm	249.60	251.70	189.00	143.60	71.90	99.50	29.72			
AB4-200	2"	50	in	9.59	10.35	7.44	5.65	2.83	3.92	1.50		8.65	3.92
			mm	249.60	262.89	189.00	143.51	71.90	99.57	38.10			

* Please reference the tailpiece data sheet #Bulletin-MB-TP for other sizes and connections.
Dimensions not for construction purposes unless certified by factory.

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

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Selection Chart - *Model AB*

STANDARD COMPONENTS	
	Pressure/Temperature test port with brass body, dual durometer EPDM core, threaded brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem. Rated to 500 PSI (3450 kPa) and 275°F (135°C)
	Memory stop with position indicator, zinc coated steel.
Please reference data sheet #Bulletin-MB-Accessories for optional accessories.	

AUTOMATIC

Model AB Automatic Balancing Valve
0.50" - 2.00"

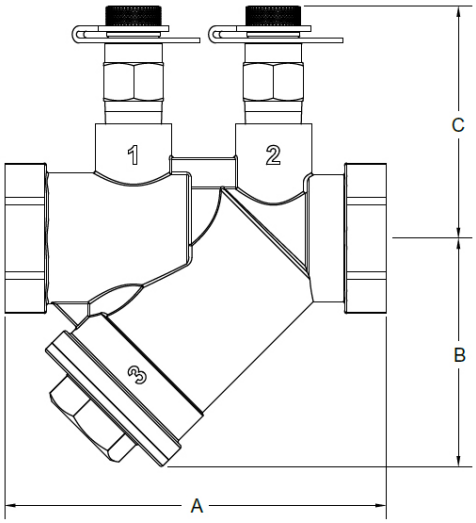
Flow GPM	2-32 PSID AB1e- 050 075 100	2-32 PSID AB2e- 050 075 100 125	2-32 PSID AB3- 100 125 150	2-32 PSID AB4- 150 200
0.35	x	x		
0.50	x	x		
0.66	x	x		
0.75	x	x		
0.88	x	x		
1.00	x	x		
1.10	x	x		
1.30	x	x		
1.50	x	x		
1.75	x	x		
2.00	x	x		
2.20	x	x		
2.50	x	x		
2.65	x	x		
3.00	x	x		
3.50	x	x		
4.00	x	x		
4.50	x	x		
5.00	x	x	x	
6.00		x	x	
7.00		x	x	
8.00		x	x	
9.00		x	x	
10.00		x	x	
11.00			x	x
12.00			x	x
13.00			x	x
14.00			x	x
15.00			x	x
16.00*			x	x

Flow GPM	2-32 PSID AB3- 100 125 150	2-32 PSID AB4- 150 200
16.00	x	x
17.00	x	x
18.00	x	x
19.00	x	x
20.00	x	x
21.00	x	x
22.00		x
24.00		x
26.00		x
28.00		x
30.00		x
32.00		x
34.00		x
36.00		x
38.00		x
40.00		x
42.00		x
44.00		x
45.00		x
48.00		x
50.00		x
52.00		x
5 - 60 PSID		
54.00		x
56.00		x
58.00		x
60.00		x
62.00		x
64.00		x
66.00		x
68.00		x
70.00		x

* AB3 and AB4 Flow GPM continues at top of last two columns.
NOTE: Lower flows can be used w/adaptor in larger sizes.

0.50”- 1.00"AL AUTOMATIC BALANCING VALVE

Model AL is a low-lead automatic flow control device. The removable flow cartridge is factory set to automatically limit the GPM to within ±5% of the specified flow.
Standard features include EPDM O-rings and seals, FNPT end connections and dual plugged accessory ports.



Above shown with optional PL test ports installed

LOW LEAD

AUTOMATIC

SPECIFICATIONS

Pressure Ratings:	400 PSI (2758 kPa)
Temperature Ratings:	250ºF (121ºC)
Accuracy:	± 5% of flow rate
Body Material:	Naval Brass, C46500 Low-Lead
End Connections:	FNPT - Inlet and Outlet
Flow Cartridge: 1/2” thru 1”	Ultrason® Composite
Seals:	EPDM
Available Options:	“PL” Low-Lead PT test port

NOMINAL DIMENSIONS & WEIGHTS

SIZE			A	B	C ±	Weight		GPM SETTINGS 2-32 PSID
in	mm					lbs	kg	
1/2”	15	in	3.70	2.15	2.19	1.15	0.52	0.35, 0.5, 0.75, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0
		mm	94.10	54.60	55.60			
3/4”	20	in	3.84	2.15	2.19	1.17	0.53	
		mm	97.50	54.60	55.60			
1”	25	in	4.23	2.15	2.19	1.32	0.60	
		mm	107.40	54.60	55.60			

NOTE: ***Dimensions not for construction purposes unless certified by factory.***
± Dimensions with optional “PL” Low-Lead Pressure / Temperature Test Port

Cartridge

OPTIONAL ACCESSORY COMPONENTS

Low-Lead Pressure / Temperature test port with brass body, dual durometer EPDM core, brass cap with O-ring seal and neoprene retainer strap.
Accepts standard 1/8” (4mm) gauge adapter or thermometer stem. Rated to 500 PSI (3450 kPa) and 275ºF (135ºC)

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

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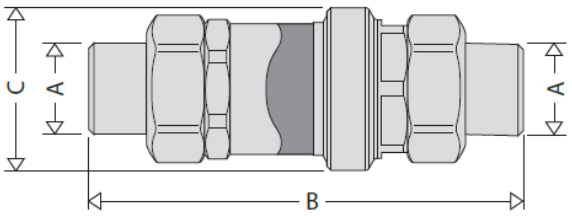
LOW LEAD

AUTOMATIC

0.50”- 1.00" Low-Lead AI Automatic Inline Valve

Model Low-Lead AI Automatic Inline Valve is an automatic flow control device. The removable flow cartridge is factory set to automatically limit the GPM to within ± 10% of the specified flow. Standard features include Low-Lead, EPDM O-rings and seals, MNPT & SWT end connections.



SPECIFICATIONS

Pressure Ratings:		232 PSI (1599 kPa)
Temperature Ratings:		250ºF (121ºC)
Accuracy:		± 10% of flow rate
Body Material:		Low-Lead Brass
End Connections:		MNPT & SWT, Inlet and Outlet
Flow Cartridge:	1/2” thru 1”	Ultrason® Composite
Seals:		EPDM

NOMINAL DIMENSIONS & WEIGHTS

SIZE			A	B	C	WEIGHT	
in	mm					lbs	kg
1/2”	15	in	0.50	4.25	1.56	0.80	0.40
		mm	12.70	107.95	39.69		
3/4”	20	in	0.75	4.81	1.56	0.80	0.40
		mm	19.05	122.24	39.69		
1”	25	in	1.00	6.00	1.56	1.00	0.50
		mm	25.40	152.40	39.69		

* ***Dimensions not for construction purposes unless certified by factory***.
Reference Differential Control Pressure Ranges graph below for pressure ranges

Cartridge

PRESSURE DIFFERENTIAL RANGE CHART

GPM	Pressure Differential Control Range (psid)	GPM	Pressure Differential Control Range (psid)
0.50	2 - 14	4.00	2 - 32
0.75		4.50	
1.00	2 - 32	5.00	4 - 34
1.50		6.00	
2.00		7.00	
2.50		8.00	
3.00		9.00	5 - 35
3.50		10.00	

ORDERING CHART

Item Number	Inlet	Outlet
LL-AI-050M-050M	1/2” MPT	1/2” MPT
LL-AI-050M-050S	1/2” MPT	1/2” SWT
LL-AI-050S-050S	1/2” SWT	1/2” SWT
LL-AI-075M-075M	3/4” MPT	3/4” MPT
LL-AI-075M-075S	3/4” MPT	3/4” SWT
LL-AI-075S-075S	3/4” SWT	3/4” SWT
LL-AI-100M-100M	1” MPT	1” MPT
LL-AI-100M-100S	1” MPT	1” SWT
LL-AI-100S-100S	1” SWT	1” SWT

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

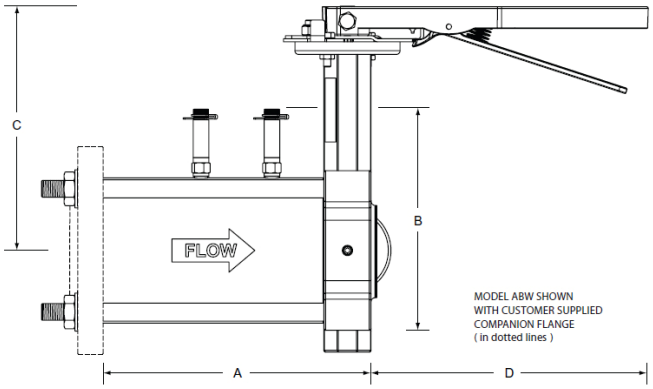
2.50”- 8.00" ABW Automatic Balancing Valve with lug type Butterfly Valve

(Model ABW for use with customer supplied companion flange)

Model ABW Automatic Balancing Valve incorporates a wafer style ductile iron body and lug type butterfly valve with adjustable flow positioning plate. The removable flow cartridge(s) is factory set to automatically limit the GPM to within ±5% of the specified flow. Shipped with Rods and Nuts for use with customer supplied companion flange. Standard features include Dual Pressure / Temperature Ports.

SPECIFICATIONS

Pressure Ratings:	200 PSIG (1380 kPa)
Temperature Ratings:	250ºF (121ºC)
Accuracy:	± 5% of flow rate
Body Material (Wafer):	Ductile Iron
Butterfly Valve:	Ductile Iron A536 65-45-12
Disc:	Aluminum Bronze B148 C954
Stem:	Stainless Steel 416 A582
Seat:	EPDM with Phenolic Backing
Bushing:	Teflon/Fiberglass Backed
Seal:	EPDM
End Connections:	ANSI Class 125/150# Flanged
Flow Cartridge(s):	Stainless Steel Wear Surfaces With Stainless Steel Springs
Available Options:	“PTV” combination PT & Air Vent



NOMINAL DIMENSIONS & WEIGHTS

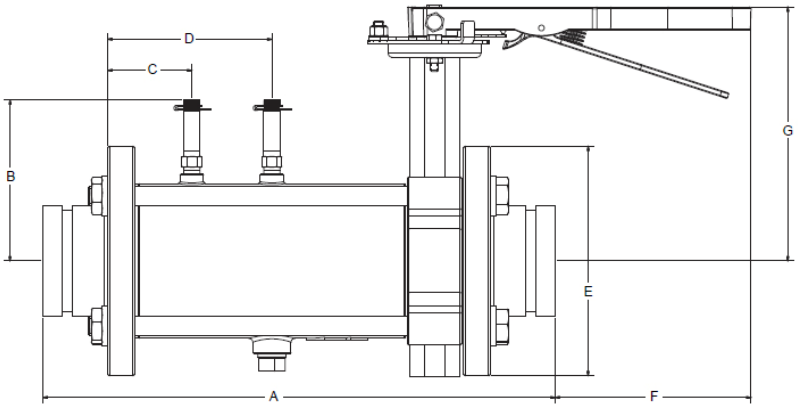
MODEL	SIZE			A	B	C	D	WEIGHT		Max. No. Cartridges	Maximum gpm (lps) Control Range psi (kPa)	
	in	mm						lbs	kg		2-32 (14-221)	5-60 (34-414)
ABW-250	2.50”	65	in	7.50	7.00	7.20	9.00	23.0	13.5	1	80 (5.0)	120 (7.6)
			mm	190	180	185	230					
ABW-300	3”	80	in	10.60	7.50	7.60	9.00	34.0	18.0	1	135 (8.5)	170 (10.7)
			mm	255	190	195	230					
ABW-400	4”	100	in	11.70	9.00	8.40	9.00	53.0	29.9	2	270 (17.0)	340 (21.4)
			mm	295	230	215	230					
ABW-500	5”	125	in	12.30	10.00	8.90	9.00	86.0	39.2	3	405 (25.5)	510 (32.1)
			mm	315	255	225	230					
ABW-600	6”	150	in	12.40	11.00	9.60	9.00	103.0	46.7	4	540 (34.0)	680 (42.8)
			mm	315	280	245	230					
ABW-800	8”	200	in	13.40	13.50	10.80	5.00	151.0	68.6	7	945 (59.5)	1190 (75.0)
			mm	340	345	275	130					

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

AUTOMATIC

2.50”- 6.00" ABG AUTOMATIC BALANCING VALVE WITH BUTTERFLY VALVE

(Model ABW with Groove x Flange Adaptors)



NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A	B	C	D	E	F	G	WEIGHT		Max. No. Cartridges	Maximum gpm (lps) Control Range psi (kPa)	
	in	mm									lbs	kg		2-32 (14-221)	5-60 (34-414)
ABG-250	2.50”	65	in	13.88	4.58	2.19	4.29	7.00	6.13	8.13	33.48	15.19	1	80 (5.0)	120 (7.6)
			mm	523.62	116.33	54.50	108.97	177.80	155.70	206.50					
ABG-300	3”	80	in	16.79	5.26	2.75	5.38	7.50	6.13	8.38	43.43	19.70	1	135 (8.5)	170 (10.7)
			mm	426.47	133.60	69.72	136.65	190.50	155.70	212.85					
ABG-400	4”	100	in	17.87	6.22	3.39	7.46	9.00	6.00	9.13	68.45	31.05	2	270 (17.0)	340 (21.4)
			mm	453.90	158.00	85.99	189.36	228.60	152.40	213.90					
ABG-500	5”	125	in	18.77	6.61	3.45	7.04	10.00	5.00	9.63	81.30	36.88	3	405 (25.5)	510 (32.1)
			mm	476.76	167.90	87.50	178.69	254.00	127.00	244.60					
ABG-600	6”	150	in	20.62	7.05	3.22	7.18	11.00	4.88	10.13	101.12	45.87	4	540 (34.0)	680 (42.8)
			mm	523.75	179.10	81.66	182.25	279.40	123.95	257.30					

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

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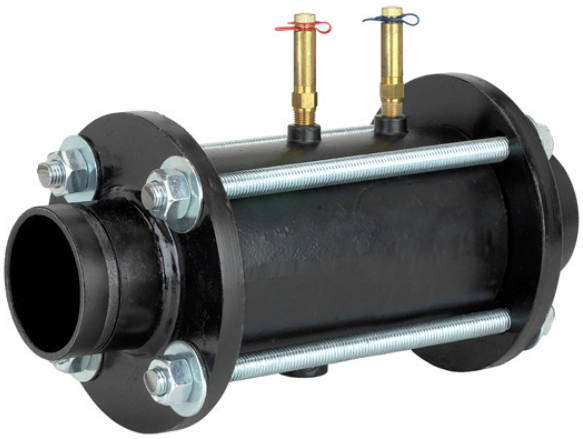
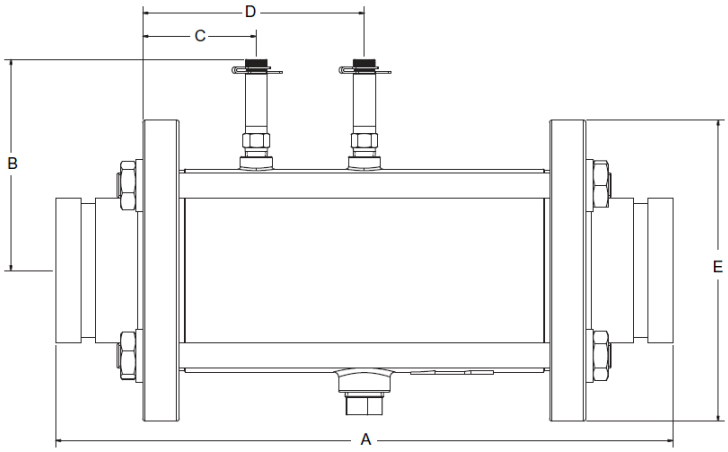
2.50”- 6.00" AG Automatic Balancing Valve
(Model AW with Groove x Flange Adaptors)





NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A	B	C	D	E	WEIGHT		Max. No. Cartridges	Maximum gpm (lps) Control Range psi (kPa)	
	in	mm							lbs	kg		2-32 (14-221)	5-60 (34-414)
AW-250	2.50”	65	in	12.07	4.58	2.19	4.29	7.00	24.00	10.89	1	80 (5.0)	120 (7.6)
			mm	306.58	116.33	54.50	108.97	177.80					
AW-300	3”	80	in	15.00	5.26	2.75	5.38	7.50	32.84	14.90	1	135 (8.5)	170 (10.7)
			mm	381.00	133.60	69.72	136.65	190.50					
AW-400	4”	100	in	15.81	6.22	3.39	7.46	9.00	51.26	23.25	2	270 (17.0)	340 (21.4)
			mm	401.57	158.00	85.99	189.36	228.60					
AW-500	5”	125	in	18.25	6.61	3.45	7.04	10.00	58.59	26.58	3	405 (25.5)	510 (32.1)
			mm	463.55	167.90	87.50	178.69	254.00					
AW-600	6”	150	in	18.41	7.05	3.22	7.18	11.00	74.00	33.57	4	540 (34.0)	680 (42.8)
			mm	467.61	179.10	81.66	182.25	279.40					

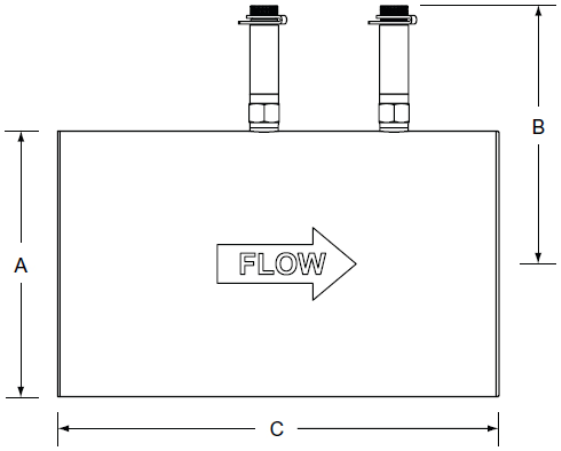
2.50”- 12.00" AW Automatic Balancing Valve

(Model AW for use with customer supplied companion flange)

Model AW Automatic Balancing Valve incorporates a wafer style ductile iron body. The removable flow cartridge(s) is factory set to automatically limit the GPM to within ±5% of the specified flow. Shipped with Rods and Nuts for use with customer supplied companion flange.
Standard features include Dual Pressure / Temperature Ports.

SPECIFICATIONS

Pressure Ratings:	600 PSIG (4140 kPa)
Temperature Ratings:	250ºF (121ºC)
Accuracy:	± 5% of flow rate
Body Material:	Ductile Iron
End Connections:	Wafer Style
Flow Cartridge(s):	Stainless Steel Wear Surfaces with Stainless Steel Springs
Available Options:	“PTV” combination PT & Air Vent



NOMINAL DIMENSIONS & WEIGHTS

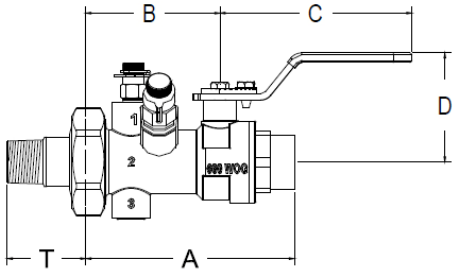
MODEL	SIZE			A	B	C	WEIGHT		Max. No. Cartridges	Maximum gpm (lps) Control Range psi (kPa)	
	in	mm					lbs	kg		2-32 (14-221)	5-60 (34-414)
AW-250	2.50”	65	in	4.30	4.80	5.82	13.0	5.9	1	80 (5.0)	120 (7.6)
			mm	109	122	148					
AW-300	3”	80	in	5.00	5.15	8.78	22.0	10.2	1	135 (8.5)	170 (10.7)
			mm	127	131	223					
AW-400	4”	100	in	6.80	6.00	9.60	35.0	15.9	2	270 (17.0)	340 (21.4)
			mm	173	152	244					
AW-500	5”	125	in	7.60	6.50	10.00	56.0	25.4	3	405 (25.5)	510 (32.1)
			mm	193	165	254					
AW-600	6”	150	in	8.50	6.80	10.16	67.0	30.4	4	540 (34.0)	680 (42.8)
			mm	216	173	258					
AW-800	8”	200	in	11.00	8.00	11.00	81.0	36.7	7	945 (59.5)	1190 (75.0)
			mm	279	203	279					
AW-1000	10”	250	in	13.30	9.30	11.00	121.0	54.9	11	1485 (93.6)	1870 (118.0)
			mm	338	236	279					
AW-1200	12”	300	in	15.90	10.60	11.00	157.0	71.2	15	2025 (128.0)	2550 (161.0)
			mm	404	269	279					

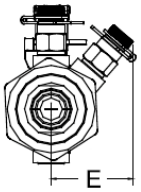
MACON® BALANCING

Model MB

Submittal Data

Model MB is a venturi style manual balancing valve with 100% positive shut-off full port plated ball. Permanently installed venturi section, Teflon seats, double o-ring shaft seals, Pressure/Temperature readout ports, adjustable memory stop with position indicator and union end with o-ring seal. Available with multiple combinations of end connection types and sizes.





SPECIFICATIONS

Pressure Ratings:	600 PSI (4140 kPa)
Temperature Ratings:	250ºF (120ºC)
Accuracy:	± 3% of flow rate
Body Material:	Forged Brass
End Connections:	Brass - Fixed End: SWT, FNPT Union End: SWT, FNPT & MNPT
Flow Element:	Brass Venturi, Permanently installed
Seals:	EPDM
Ball:	Chrome Plated Brass, full port, 100% positive shut-off. *Optional 316 Stainless Steel.*
Stem:	Brass. *Optional 316 Stainless Steel.*
Handle:	Full size Zinc Plated lever with Vinyl Grip
Memory Stop:	Zinc Plated Steel
Available Options:	"PTV" combination PT & Air Vent, hose end Drain Valve & Extensions

MANUAL

NOMINAL DIMENSIONS & WEIGHTS

SIZE		Flow Range		A		B	C	D	E	*T	Cv	Weight	
in	mm	GPM (10"-100")		FNPT	SWT					MPT		lbs	kg
1/2"	15	(L) 0.4 - 1.3 (H) 1.3 - 4.0	in	3.46	3.55	2.30	3.66	1.98	1.82	1.50	(L) 2.0 (H) 5.9	1.31	0.59
			mm	87.78	90.25	58.42	93.02	50.29	46.20	38.10			
3/4"R	20	(L) 0.4 - 1.3 (H) 1.3 - 4.0	in	3.60	3.67	2.30	3.66	1.98	1.82	1.55	(L) 2.0 (H) 5.9	1.34	0.61
			mm	91.47	93.27	58.42	93.02	50.29	46.20	39.37			
3/4"	20	(L) 1.6 - 5.0 (H) 4.0 - 13.0	in	3.87	3.98	2.56	3.66	2.08	2.05	1.56	(L) 7.6 (H) 13.0	1.81	0.82
			mm	98.30	101.12	65.05	93.01	52.83	52.07	39.70			
1"R	25	(L) 1.6 - 5.0 (H) 4.0 - 13.0	in	4.00	4.14	2.56	3.66	2.08	2.05	1.75	(L) 7.6 (H) 13.0	1.81	0.82
			mm	101.60	105.16	65.03	92.96	52.83	52.07	44.45			
1-1/4"	32	7.25 - 23.0	in	5.39	5.56	3.70	5.03	2.44	2.43	1.80	29.00	4.59	2.08
			mm	136.83	141.25	93.95	127.76	61.90	61.74	45.72			
1-1/2"	40	9.5 - 30.0	in	6.06	6.38	4.16	5.66	2.83	2.43	1.80	45.00	4.97	2.25
			mm	153.92	162.05	105.66	143.76	71.88	61.74	45.72			
2"R	50	15.0 - 50.0	in	6.57	7.36	4.45	5.66	2.83	2.74	1.98	77.40	7.10	3.20
			mm	166.90	187.00	113.00	143.60	71.90	69.67	50.29			

* Please reference the tailpiece data sheet #Bulletin-MB-TP for other sizes and connections.
Dimensions not for construction purposes unless certified by factory.

STANDARD COMPONENTS

Pressure / Temperature test port with brass body, dual durometer EPDM core, brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem. Rated to 500 PSI (3450 kPa) and 275ºF (135ºC)

Memory stop with position indicator, zinc coated steel.

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

Differential Pressure Table - *Model MB*

Model MB Venturi Type Balancing Valve 0.50" - 2.00"											
Differential Pressure: Inches W.C.											
	Model MB -								Model MB -		
Flow GPM	050L 075RL 075CL	050H 075RH 075CH	075L 100RL 100CL	075H 100RH 100CH	100	125	150	**Flow GPM**	125	150	200 200C
0.10	1							18.00	**62**	**36**	**14**
0.20	2							19.00	**69**	**41**	**15**
0.30	5							20.00	**76**	**45**	**17**
0.42	**10**	1						21.00	**84**	**50**	**19**
0.50	**14**	1.5	1					22.00	**92**	**54**	**21**
0.75	**31**	3	2					23.00	**101**	**60**	**23**
1.00	**55**	6	4		1			24.00	110	**65**	**25**
1.25	**86**	9	6		1.5			25.00	119	**70**	**27**
1.35	**101**	**11**	7	1	2			26.00	129	**76**	**29**
1.50	124	**13**	**9**	1.4	2.3			27.00	139	**82**	**31**
2.00	221	**23**	**16**	2.5	4			28.00	149	**88**	**34**
2.25		**29**	**21**	3	5			29.00	160	**95**	**36**
2.50		**36**	**25**	4	6	1.2		30.00	171	**101**	**39**
3.00		**52**	**36**	6	9	1.7		31.00	183	108	**41**
3.50		**71**	**50**	8	**13**	2.3	1.4	32.00	195	115	**44**
4.00		**92**	**65**	**10**	**16**	3	1.8	33.00	207	122	**47**
4.50		117	**82**	**13**	**21**	4	2.3	34.00	220	130	**50**
5.00		144	**101**	**15**	**26**	5	3	35.00	233	138	**53**
5.50		175	123	**19**	**31**	6	3.4	36.00		146	**56**
6.00		208	146	**22**	**37**	7	4	37.00		154	**59**
6.50		244	171	**26**	**43**	8	5	39.00		171	**65**
7.25			213	**33**	**54**	**10**	6	40.00		180	**69**
7.50			228	**35**	**58**	**11**	6.4	41.00		189	**72**
8.00				**40**	**65**	**12**	7	42.00		198	**76**
8.50				**45**	**74**	**14**	8	43.00		208	**79**
9.00				**50**	**83**	**15**	9	44.00		218	**83**
9.50				**56**	**92**	**17**	**10**	45.00		228	**87**
10.00				**62**	**102**	**19**	**11**	48.50			**101**
10.50				**68**	113	**21**	**12**	55.00			130
11.00				**75**	124	**23**	**14**	60.00			154
11.50				**82**	135	**25**	**15**	65.00			181
12.00				**89**	147	**27**	**16**	70.00			210
12.50				**97**	160	**30**	**18**	75.00			241
13.00				105	173	**32**	**19**				
14.00				121	200	**37**	**22**				
15.00				139		**43**	**25**				
16.00				159		**49**	**29**				
17.00				179		**55**	**33**				
Size	0.50" L 0.75" RL 0.75" CL	0.50" H 0.75" RH 0.75" CH	0.75" L 1.00" RL 1.00" CL	0.75" H 1.00" RH 1.00" CH	1.00"	1.25"	1.50"		1.25"	1.50"	2.00" 2.00" C
FF	0.1346	0.4163	0.4967	1.2704	0.9889	2.2921	2.9816		2.2921	2.9816	4.8274

Flow Formulas

GPM = FF x (√DP)

DP = $(GPM/FF)^2$

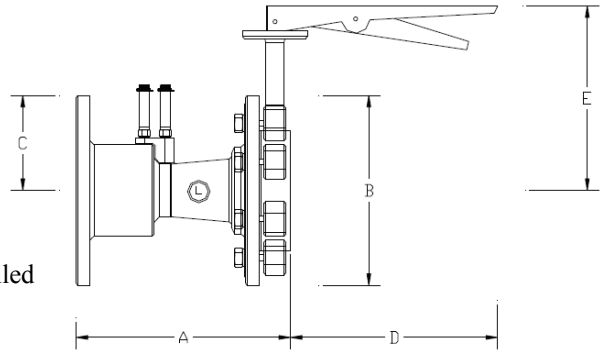
PPL = DP x 0.12

Notes:

1) Accuracy ± 3% of flow rate. 2) Repeatability ± 0.25% of rate.
3) Values in **BOLD** type represents traditional 10" to 100" sizing range.
4) All valves will function above and below ranges shown. Pressure drop and readability should be taken into account.

MANUAL

Model MBF Manual Balancing Valve features a cast steel venturi flow element. The precision machined throat provides measurement accuracy of ± 3% of flow rate. Mounted on the discharge is a ductile iron lug type butterfly valve with adjustable flow positioning plate. ANSI 125/150 flanged end connections. Dual extended length Pressure/Temperature ports. Hanging I.D. Tag.



SPECIFICATIONS

Pressure Ratings:		200 PSI (1380 kPa)
Temperature Ratings:		225ºF (107ºC)
Accuracy:		± 3% of flow rate
Body Material:	Venturi:	Carbon Steel ASTM A-120
	Butterfly Valve:	Ductile Iron A536 65-45-12
End Connections:		ANSI Class 125/150# Flanged
Flow Element:		Brass Venturi, Permanently installed
Disc:		Aluminum Bronze B148 C954
Stem:		Stainless Steel 416 A582
Seat:		EPDM with Phenolic Backing
Bushing:		Teflon/Fiberglass Backed
Seal:		EPDM
Metering Ports:		Extended Length Pressure/Temperature test ports
Available Options:		"PTV" combination PT & Air Vent

MANUAL

NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A	B	C	D	E	Weight	
	in	mm							lbs	kg
MBF-250	2-1/2"	65	in	8.75	7.00	4.20	9.12	8.13	32.00	14.51
			mm	222.25	177.80	106.65	231.90	206.50		
MBF-300	3"	75	in	9.78	7.50	4.54	9.13	8.38	38.00	17.23
			mm	248.41	190.50	115.29	231.90	212.85		
MBF-400	4"	100	in	11.50	9.00	5.02	9.00	9.13	55.00	24.94
			mm	292.10	228.60	127.48	228.60	231.90		
MBF-500	5"	125	in	13.13	10.00	5.53	9.00	9.63	79.00	35.83
			mm	333.50	254.00	140.49	228.60	244.60		
MBF-600	6"	150	in	14.73	11.00	6.04	8.88	10.13	92.00	41.73
			mm	374.14	279.40	153.39	225.55	257.30		

Dimensions not for construction purposes unless certified by factory.

STANDARD COMPONENTS

Pressure / Temperature test port with brass body, dual durometer EPDM core, PTE Extender, brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem. Rated to 500 PSI (3450 kPa) and 275ºF (135ºC)

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

Differential Pressure Table - *Model Sizes 2.50" to 6.00"*

Model MBF / MF, MBG / MG, MP, VF, VG & VW Valves size 2.50" - 6.00"										
Differential Pressure: Inches W.C.										
Flow GPM	**Model Size**					**Flow GPM**	**Model Size**			
	250	300	400	500	600		400	500	600	
24.0	**10**					300.0	123	**32**	**18**	
26.0	**12**					325.0	144	**38**	**21**	
28.0	**14**					350.0	167	**44**	**24**	
30.0	**16**					375.0	191	**50**	**28**	
32.0	**18**					400.0		**57**	**32**	
34.0	**20**					425.0		**64**	**36**	
36.0	**22**					450.0		**72**	**40**	
38.0	**25**					475.0		**80**	**45**	
40.0	**28**					500.0		**89**	**50**	
42.0	**31**					525.0		**98**	**55**	
44.0	**34**	8				550.0		108	**60**	
46.0	**37**	9				575.0		118	**66**	
48.0	**40**	**10**				600.0		128	**71**	
50.0	**43**	**11**	3			625.0		139	**78**	
55.0	**52**	**13**	4			650.0		150	**84**	
60.0	**62**	**15**	5			675.0		162	**90**	
65.0	**73**	**18**	6			700.0		175	**97**	
70.0	**85**	**21**	7			725.0		187	104	
75.0	**97**	**24**	8			750.0		200	112	
80.0	111	**27**	9			775.0			119	
85.0	125	**31**	**10**			800.0			127	
90.0	140	**35**	**11**			825.0			135	
95.0	156	**39**	**12**			850.0			143	
100.0	173	**43**	**14**			900.0			161	
110.0		**52**	**16**	4		925.0			170	
120.0		**62**	**20**	5		950.0			179	
130.0		**72**	**23**	6		975.0			189	
140.0		**84**	**27**	7		1000.0			199	
150.0		**96**	**31**	8		1100.0				
160.0		109	**35**	9		1200.0				
170.0		124	**39**	**10**		1300.0				
180.0		138	**44**	**12**	6	1400.0				
190.0		154	**49**	**13**	7	1500.0				
200.0		171	**54**	**14**	8					
220.0			**66**	**17**	**10**					
240.0			**78**	**21**	**11**					
260.0			**92**	**24**	**13**					
280.0			107	**28**	**16**					
Size	2.50"	3.00"	4.00"	5.00"	6.00"	**Size**	4.00"	5.00"	6.00"	
FF	7.600	15.297	27.104	52.986	70.972	**FF**	27.104	52.986	70.972	

Flow Formulas

GPM = FF x ($\sqrt{DP}$)

DP = $(GPM/FF)^2$

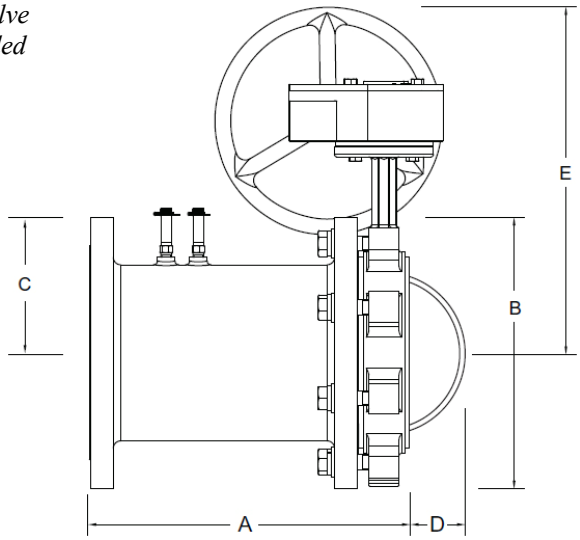
PPL = DP x 0.12

Notes:

1) Accuracy ± 3% of flow rate.
2) Repeatability ± 0.25% of rate.
3) Values in **BOLD** type represents traditional 10" to 100" sizing range.
4) All valves will function above and below ranges shown. Pressure drop and readability should be taken into account.

MANUAL

Model MBF Manual Balancing Valve features a fabricated steel venturi flow element. Mounted on the discharge is a ductile iron lug type butterfly valve with gear operator. ANSI 125/150 flanged end connections. Dual extended length Pressure / Temperature ports. Hanging I.D. Tag.



SPECIFICATIONS

Pressure Ratings:		200 PSI (1380 kPa)
Temperature Ratings:		225ºF (107ºC)
Accuracy:		± 3% of flow rate
Body Material:	Venturi:	Carbon Steel ASTM A-120
	Butterfly Valve:	Ductile Iron A536 65-45-12
End Connections:		ANSI Class 125/150# Flanged
Disc:		Aluminum Bronze B148 C954
Stem:		Stainless Steel 416 A582
Seat:		EPDM with Phenolic Backing
Bushing:		Teflon/Fiberglass Backed
Seal:		EPDM
Metering Ports:		Extended Length Pressure/Temperature test ports
Available Options:		"PTV" combination PT & Air Vent

MANUAL

NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A	B	C	D	E	Weight	
	in	mm							lbs	kg
MBF-800	8.0"	203.2	in	15.88	13.50	6.75	2.72	17.46	145	65.77
			mm	403.35	342.90	171.45	69.15	443.50		
MBF-1000	10.0"	254.0	in	17.06	16.00	8.00	3.52	18.72	200	90.71
			mm	433.32	406.40	203.20	89.31	475.50		
MBF-1200	12.0"	304.8	in	19.30	19.00	9.50	4.34	20.63	333	153.05
			mm	490.22	482.60	241.30	110.25	524.00		

Dimensions not for construction purposes unless certified by factory.

STANDARD COMPONENTS

Pressure / Temperature test port with brass body, dual durometer EPDM core, PTE Extender, brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem. Rated to 500 PSI (3450 kPa) and 275ºF (135ºC)

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

Cv VALUE (US-GPM @ 1△P) ***Cv Value when valve is in different opening angle***

MODEL	SIZE	10º	20º	30º	40º	50º	60º	70º	80º	90º
MBF-800	8.0"	3	89	188	408	727	1202	1903	2854	3136
MBF-1000	10.0"	4	151	320	694	1237	2047	3240	4859	5340
MBF-1200	12.0"	5	234	495	1072	1911	3162	5005	7507	8250

Differential Pressure Table - *Model Sizes 8" to 16"*

Model MBF / MF, MBG / MG Valves Size 8" - 12" / VF, VG & VW Valves Size 8" - 16"						
Differential Pressure: Inches W.C.						
	Models MBF/MF, MBG/MG VF, VG & VW			**Models MBF/MF, MBG/MG, VF, VG & VW**	**Models VF, VG & VW**	
Flow GPM	**Model Size**		**Flow GPM**	**Model Size**		
	800	**1000**		**1200**	**1400**	**1600**
400.0	**10**		1000.0	7		
425.0	**12**		1100.0	9		
450.0	**14**		1200.0	**10**		
475.0	**16**		1300.0	**12**	7	
500.0	**18**		1400.0	**14**	8	
525.0	**20**		1500.0	**16**	9	
550.0	**22**		1600.0	**19**	**11**	
575.0	**25**		1700.0	**21**	**12**	
600.0	**28**		1800.0	**23**	**13**	
625.0	**31**		1900.0	**26**	**15**	8
650.0	**34**	8	2000.0	**29**	**17**	9
675.0	**37**	9	2200.0	**35**	**20**	**11**
700.0	**40**	**10**	2400.0	**42**	**24**	**13**
725.0	**43**	**11**	2600.0	**49**	**28**	**16**
750.0	**52**	**13**	2800.0	**57**	**33**	**18**
775.0	**62**	**15**	3000.0	**65**	**37**	**21**
800.0	**73**	**18**	3200.0	**74**	**43**	**24**
825.0	**85**	**21**	3400.0	**84**	**48**	**27**
850.0	**97**	**24**	3600.0	**94**	**54**	**30**
875.0	111	**27**	3800.0	105	**60**	**34**
900.0	125	**31**	4000.0	116	**67**	**37**
925.0	140	**35**	4200.0	128	**73**	**41**
950.0	156	**39**	4400.0	140	**81**	**45**
975.0	173	**43**	4500.0		**84**	**47**
1000.0		**52**	4600.0		**88**	**49**
1100.0		**62**	4700.0		**92**	**51**
1200.0		**72**	4800.0		**96**	**54**
1300.0		**84**	5000.0		104	**58**
1400.0		**96**	5200.0			**63**
1500.0		109	5400.0			**68**
1600.0		124	5600.0			**73**
1700.0		138	5800.0			**78**
1800.0		154	6000.0			**84**
1900.0		171	6400.0			**95**
2000.0			6800.0			108
2200.0						
2400.0						
Size	8"	10"	**Size**	12"	14"	16"
FF	130.61	192.54	**FF**	371.4	490.29	655.0

Flow Formulas

GPM = FF x ($\sqrt{DP}$)

DP = $(GPM/FF)^2$

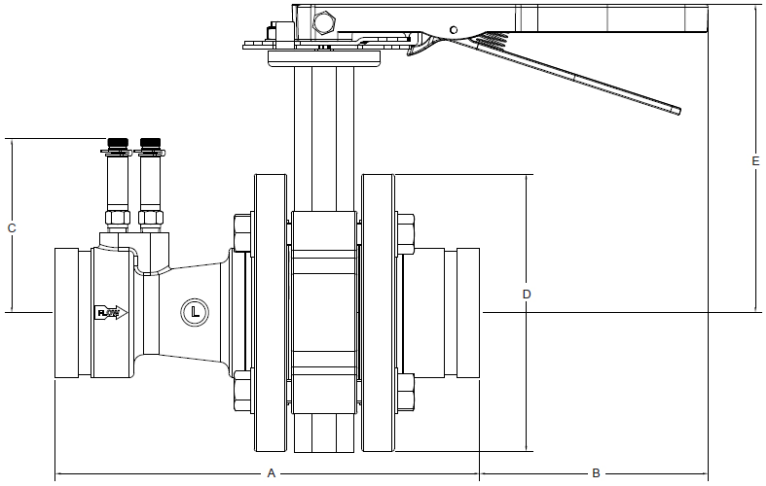
PPL = DP x 0.12

Notes:

1) Accuracy ± 3% of flow rate.
2) Repeatability ± 0.25% of rate.
3) Values in **BOLD** type represents traditional 10" to 100" sizing range.
4) All valves will function above and below ranges shown. Pressure drop and readability should be taken into account.

MANUAL

2.50"- 6.00" MG Automatic Balancing Valve
(Model MBF With Groove x Flanged Adaptors)



NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A	B	C	D	E	Weight	
	in	mm							lbs	kg
MG-250	2-1/2"	64	in	10.87	6.22	4.36	7.00	8.10	23.5	10.66
			mm	276.10	157.99	110.74	177.80	205.74		
MG-300	3"	75	in	11.47	6.17	4.70	7.50	8.34	28.4	12.88
			mm	291.34	156.72	119.38	190.50	211.84		
MG-400	4"	100	in	13.62	5.91	5.18	9.00	9.09	73.0	19.50
			mm	345.95	150.11	131.57	228.60	230.89		
MG-500	5"	125	in	14.64	5.97	5.69	10.00	9.60	73.0	33.11
			mm	371.86	151.64	144.53	254.00	243.84		
MG-600	6"	150	in	17.05	5.21	6.20	11.00	10.11	89.9	40.78
			mm	433.07	132.33	157.48	279.40	256.79		

Dimensions not for construction purposes unless certified by factory.

STANDARD COMPONENTS

Pressure / Temperature test port with brass body, dual durometer EPDM core, PTE Extender, brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem. Rated to 500 PSI (3450 kPa) and 275ºF (135ºC)

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

Differential Pressure Table - *Model Sizes 2.50" to 6.00"*

Model MBF / MF, MBG / MG, MP, VF, VG & VW Valves size 2.50" - 6.00"										
Differential Pressure: Inches W.C.										
Flow GPM	**Model Size**					**Flow GPM**	**Model Size**			
	250	300	400	500	600		400	500	600	
24.0	**10**					300.0	123	**32**	**18**	
26.0	**12**					325.0	144	**38**	**21**	
28.0	**14**					350.0	167	**44**	**24**	
30.0	**16**					375.0	191	**50**	**28**	
32.0	**18**					400.0		**57**	**32**	
34.0	**20**					425.0		**64**	**36**	
36.0	**22**					450.0		**72**	**40**	
38.0	**25**					475.0		**80**	**45**	
40.0	**28**					500.0		**89**	**50**	
42.0	**31**					525.0		**98**	**55**	
44.0	**34**	8				550.0		108	**60**	
46.0	**37**	9				575.0		118	**66**	
48.0	**40**	**10**				600.0		128	**71**	
50.0	**43**	**11**	3			625.0		139	**78**	
55.0	**52**	**13**	4			650.0		150	**84**	
60.0	**62**	**15**	5			675.0		162	**90**	
65.0	**73**	**18**	6			700.0		175	**97**	
70.0	**85**	**21**	7			725.0		187	104	
75.0	**97**	**24**	8			750.0		200	112	
80.0	111	**27**	9			775.0			119	
85.0	125	**31**	**10**			800.0			127	
90.0	140	**35**	**11**			825.0			135	
95.0	156	**39**	**12**			850.0			143	
100.0	173	**43**	**14**			900.0			161	
110.0		**52**	**16**	4		925.0			170	
120.0		**62**	**20**	5		950.0			179	
130.0		**72**	**23**	6		975.0			189	
140.0		**84**	**27**	7		1000.0			199	
150.0		**96**	**31**	8		1100.0				
160.0		109	**35**	9		1200.0				
170.0		124	**39**	**10**		1300.0				
180.0		138	**44**	**12**	6	1400.0				
190.0		154	**49**	**13**	7	1500.0				
200.0		171	**54**	**14**	8					
220.0			**66**	**17**	**10**					
240.0			**78**	**21**	**11**					
260.0			**92**	**24**	**13**					
280.0			107	**28**	**16**					
Size	2.50"	3.00"	4.00"	5.00"	6.00"	**Size**	4.00"	5.00"	6.00"	
FF	7.600	15.297	27.104	52.986	70.972	**FF**	27.104	52.986	70.972	

Flow Formulas

GPM = FF x ($\sqrt{DP}$)

DP = $(GPM/FF)^2$

PPL = DP x 0.12

Notes:

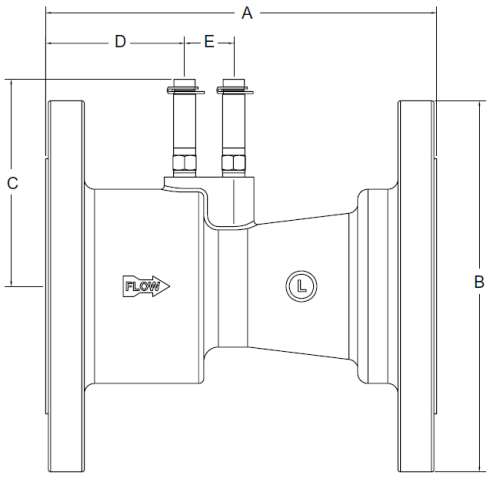
1) Accuracy ± 3% of flow rate.
2) Repeatability ± 0.25% of rate.
3) Values in **BOLD** type represents traditional 10" to 100" sizing range.
4) All valves will function above and below ranges shown. Pressure drop and readability should be taken into account.

MANUAL

Model VF Venturi Flowmeter features a cast steel venturi flow element. The precision machined throat provides measurement accuracy of ± 3% of flow rate. ANSI 125/150 flanged end connections. Dual extended length Pressure/ Temperature ports and Hanging I.D. Tag.

SPECIFICATIONS

Pressure Ratings:	240 PSI (1655 kPa)
Temperature Ratings:	250ºF (120ºC)
Accuracy:	± 3% of flow rate
Body Material: Venturi:	Carbon Steel ASTM A-120
End Connections:	ANSI Class 150# Flanged
	Optional ANSI Class 300# Flanged
Metering Ports:	Extended Length Pressure/Temperature test ports
Available Options:	"PTV" combination PT & Air Vent



MANUAL

NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A	B	C	D	E	Weight	
	in	mm							lbs	kg
VF-250	2-1/2"	65	in	7.00	7.00	4.20	3.12	0.74	20	9.08
			mm	177.80	177.80	106.65	79.38	18.75		
VF-300	3"	75	in	8.00	7.50	4.54	3.38	0.88	25	11.35
			mm	203.20	190.50	115.29	85.73	24.48		
VF-400	4"	100	in	9.50	9.00	5.02	3.38	1.19	36	16.33
			mm	241.30	228.60	127.48	85.73	30.35		
VF-500	5"	125	in	11.00	10.00	5.53	3.88	1.31	45	20.41
			mm	279.40	254.00	140.49	98.43	33.27		
VF-600	6"	150	in	12.50	11.00	6.04	3.88	1.60	55	24.95
			mm	317.50	279.40	153.39	98.43	40.64		

Dimensions not for construction purposes unless certified by factory.

STANDARD COMPONENTS

Pressure / Temperature test port with brass body, dual durometer EPDM core, PTE Extender, brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem. Rated to 500 PSI (3450 kPa) and 275ºF (135ºC)

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

Differential Pressure Table - *Model Sizes 2.50" to 6.00"*

Model MBF / MF, MBG / MG, MP, VF, VG & VW Valves size 2.50" - 6.00"										
Differential Pressure: Inches W.C.										
Flow GPM	**Model Size**					**Flow GPM**	**Model Size**			
	250	300	400	500	600		400	500	600	
24.0	**10**					300.0	123	**32**	**18**	
26.0	**12**					325.0	144	**38**	**21**	
28.0	**14**					350.0	167	**44**	**24**	
30.0	**16**					375.0	191	**50**	**28**	
32.0	**18**					400.0		**57**	**32**	
34.0	**20**					425.0		**64**	**36**	
36.0	**22**					450.0		**72**	**40**	
38.0	**25**					475.0		**80**	**45**	
40.0	**28**					500.0		**89**	**50**	
42.0	**31**					525.0		**98**	**55**	
44.0	**34**	8				550.0		108	**60**	
46.0	**37**	9				575.0		118	**66**	
48.0	**40**	**10**				600.0		128	**71**	
50.0	**43**	**11**	3			625.0		139	**78**	
55.0	**52**	**13**	4			650.0		150	**84**	
60.0	**62**	**15**	5			675.0		162	**90**	
65.0	**73**	**18**	6			700.0		175	**97**	
70.0	**85**	**21**	7			725.0		187	104	
75.0	**97**	**24**	8			750.0		200	112	
80.0	111	**27**	9			775.0			119	
85.0	125	**31**	**10**			800.0			127	
90.0	140	**35**	**11**			825.0			135	
95.0	156	**39**	**12**			850.0			143	
100.0	173	**43**	**14**			900.0			161	
110.0		**52**	**16**	4		925.0			170	
120.0		**62**	**20**	5		950.0			179	
130.0		**72**	**23**	6		975.0			189	
140.0		**84**	**27**	7		1000.0			199	
150.0		**96**	**31**	8		1100.0				
160.0		109	**35**	9		1200.0				
170.0		124	**39**	**10**		1300.0				
180.0		138	**44**	**12**	6	1400.0				
190.0		154	**49**	**13**	7	1500.0				
200.0		171	**54**	**14**	8					
220.0			**66**	**17**	**10**					
240.0			**78**	**21**	**11**					
260.0			**92**	**24**	**13**					
280.0			107	**28**	**16**					
Size	2.50"	3.00"	4.00"	5.00"	6.00"	**Size**	4.00"	5.00"	6.00"	
FF	7.600	15.297	27.104	52.986	70.972	**FF**	27.104	52.986	70.972	

Flow Formulas

GPM = FF x ($\sqrt{DP}$)

DP = $(GPM/FF)^2$

PPL = DP x 0.12

Notes:

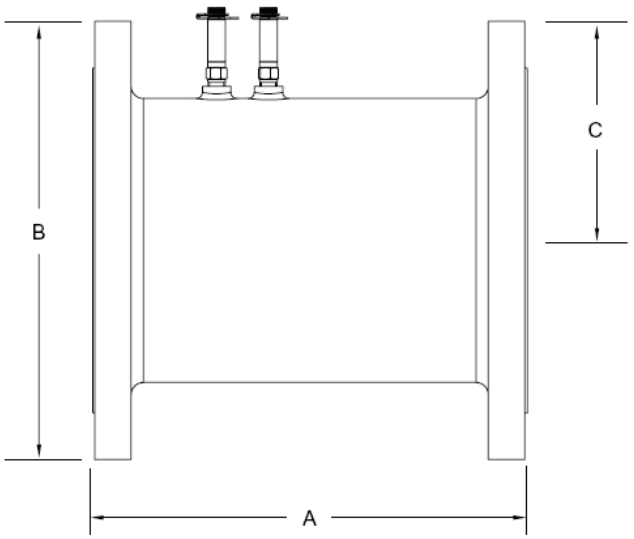
1) Accuracy ± 3% of flow rate.
2) Repeatability ± 0.25% of rate.
3) Values in **BOLD** type represents traditional 10" to 100" sizing range.
4) All valves will function above and below ranges shown. Pressure drop and readability should be taken into account.

MANUAL

Model VF Venturi Flowmeter features a cast steel venturi flow element. The welded steel insert provides measurement accuracy of ± 3% of flow rate. ANSI 125/150 flanged end connections. Dual extended length Pressure/ Temperature ports and Hanging I.D. Tag.

SPECIFICATIONS

Pressure Ratings:	200 PSI (1380 kPa)
Temperature Ratings:	250ºF (120ºC)
Accuracy:	± 3% of flow rate
Body Material: Venturi:	Carbon Steel ASTM A-120
End Connections:	ANSI Class 150# Flanged
	Optional ANSI Class 300# Flanged
Metering Ports:	Extended Length Pressure/Temperature test ports
Available Options:	"PTV" combination PT & Air Vent



MANUAL

NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A	B	C	Weight	
	in	mm					lbs	kg
VF-800	8.0"	203.2	in	13.50	13.50	6.75	91.0	41.27
			mm	342.9	342.9	171.45		
VF-1000	10.0"	254.0	in	14.50	16.00	8.00	117.5	53.29
			mm	368.3	406.4	203.2		
VF-1200	12.0"	304.8	in	21.00	19.00	9.50	218.0	98.88
			mm	533.4	482.6	241.3		
VF-1400	14.0"	355.6	in	24.00	21.00	10.50	305.0	138.34
			mm	609.6	533.6	266.7		
VF-1600	16.0"	406.4	in	36.00	23.50	11.75	435.0	197.31
			mm	914.4	596.9	298.45		

Differential Pressure Table - *Model Sizes 8" to 16"*

Model MBF / MF, MBG / MG Valves Size 8" - 12" / VF, VG & VW Valves Size 8" - 16"						
Differential Pressure: Inches W.C.						
	Models MBF/MF, MBG/MG VF, VG & VW			**Models MBF/MF, MBG/MG, VF, VG & VW**	**Models VF, VG & VW**	
Flow GPM	**Model Size**		**Flow GPM**	**Model Size**		
	800	**1000**		**1200**	**1400**	**1600**
400.0	**10**		1000.0	7		
425.0	**12**		1100.0	9		
450.0	**14**		1200.0	**10**		
475.0	**16**		1300.0	**12**	7	
500.0	**18**		1400.0	**14**	8	
525.0	**20**		1500.0	**16**	9	
550.0	**22**		1600.0	**19**	**11**	
575.0	**25**		1700.0	**21**	**12**	
600.0	**28**		1800.0	**23**	**13**	
625.0	**31**		1900.0	**26**	**15**	8
650.0	**34**	8	2000.0	**29**	**17**	9
675.0	**37**	9	2200.0	**35**	**20**	**11**
700.0	**40**	**10**	2400.0	**42**	**24**	**13**
725.0	**43**	**11**	2600.0	**49**	**28**	**16**
750.0	**52**	**13**	2800.0	**57**	**33**	**18**
775.0	**62**	**15**	3000.0	**65**	**37**	**21**
800.0	**73**	**18**	3200.0	**74**	**43**	**24**
825.0	**85**	**21**	3400.0	**84**	**48**	**27**
850.0	**97**	**24**	3600.0	**94**	**54**	**30**
875.0	111	**27**	3800.0	105	**60**	**34**
900.0	125	**31**	4000.0	116	**67**	**37**
925.0	140	**35**	4200.0	128	**73**	**41**
950.0	156	**39**	4400.0	140	**81**	**45**
975.0	173	**43**	4500.0		**84**	**47**
1000.0		**52**	4600.0		**88**	**49**
1100.0		**62**	4700.0		**92**	**51**
1200.0		**72**	4800.0		**96**	**54**
1300.0		**84**	5000.0		104	**58**
1400.0		**96**	5200.0			**63**
1500.0		109	5400.0			**68**
1600.0		124	5600.0			**73**
1700.0		138	5800.0			**78**
1800.0		154	6000.0			**84**
1900.0		171	6400.0			**95**
2000.0			6800.0			108
2200.0						
2400.0						
Size	8"	10"	**Size**	12"	14"	16"
FF	130.61	192.54	**FF**	371.4	490.29	655.0

Flow Formulas

GPM = FF x ($\sqrt{DP}$)

DP = $(GPM/FF)^2$

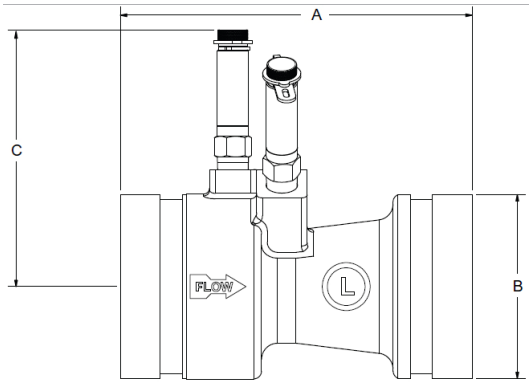
PPL = DP x 0.12

Notes:

1) Accuracy ± 3% of flow rate.
2) Repeatability ± 0.25% of rate.
3) Values in **BOLD** type represents traditional 10" to 100" sizing range.
4) All valves will function above and below ranges shown. Pressure drop and readability should be taken into account.

MANUAL

Model VG/VW Venturi Flowmeter features a carbon steel venturi flow element. The precision machined throats provides measurement accuracy of ± 3% of flow rate. Model VG offers Grooved end connections. Model VW offers Weld end connections. Dual extended length Pressure/Temperature ports and Hanging I.D. Tag.



SPECIFICATIONS

Pressure Ratings:		400 PSI (2758 kPa)
Temperature Ratings:		250ºF (120ºC)
Accuracy:		± 3% of flow rate
Body Material:	Venturi:	Size 2.5" - 6.0" - ASTM A-216 Grade WCB Size 8.0" - 16.0" - ASTM A-120
End Connections:		VG = Grooved End Connections VW = Weld End Connections
Metering Ports:		Extended Length Pressure/Temperature test ports
Available Options:		"PTV" combination PT & Air Vent

NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A	B	C	Weight - VG		Weight - VW	
	in	mm					lbs	kg	lbs	kg
VF-250	2-1/2"	65	in	5.50	2.88	4.25	3.39	1.54	3.50	1.59
			mm	139.70	73.15	107.90				
VF-300	3"	75	in	6.00	3.50	4.59	4.91	2.23	5.02	2.28
			mm	152.40	88.90	116.59				
VF-400	4"	100	in	7.50	4.50	5.07	8.27	3.75	8.40	3.81
			mm	190.50	114.30	128.78				
VF-500	5"	125	in	8.75	5.56	5.58	13.02	5.91	13.14	5.96
			mm	222.25	141.22	141.73				
VF-600	6"	150	in	10.25	6.63	6.09	18.78	8.52	18.94	8.59
			mm	260.35	168.40	154.69				
VF-800	8"	200	in	12.50	8.63	7.05	34.00	15.42	29.70	13.47
			mm	317.50	219.20	179.07				
VF-1000	10"	250	in	13.50	10.75	8.11	54.00	24.49	45.50	20.63
			mm	342.90	273.05	206.00				
VF-1200	12"	300	in	12.00	12.75	7.63	54.00	24.49	54.00	24.49
			mm	304.80	323.85	193.80				
VF-1400	14"	355	in	19.00	14.00	8.25	72.30	32.79	72.30	32.79
			mm	482.60	355.60	209.55				
VF-1600	16"	406	in	26.00	16.00	9.25	144.00	65.31	144.00	65.31
			mm	660.40	406.40	234.95				

Dimensions not for construction purposes unless certified by factory.

STANDARD COMPONENTS

Pressure / Temperature test port with brass body, dual durometer EPDM core, PTE Extender, brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem. Rated to 500 PSI (3450 kPa) and 275ºF (135ºC)

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

MANUAL

Differential Pressure Table - *Model Sizes 2.50" to 6.00"*

Model MBF / MF, MBG / MG, MP, VF, VG & VW Valves size 2.50" - 6.00"									
Differential Pressure: Inches W.C.									
Flow GPM	**Model Size**					**Flow GPM**	**Model Size**		
	250	300	400	500	600		400	500	600
24.0	**10**					300.0	123	**32**	**18**
26.0	**12**					325.0	144	**38**	**21**
28.0	**14**					350.0	167	**44**	**24**
30.0	**16**					375.0	191	**50**	**28**
32.0	**18**					400.0		**57**	**32**
34.0	**20**					425.0		**64**	**36**
36.0	**22**					450.0		**72**	**40**
38.0	**25**					475.0		**80**	**45**
40.0	**28**					500.0		**89**	**50**
42.0	**31**					525.0		**98**	**55**
44.0	**34**	8				550.0		108	**60**
46.0	**37**	9				575.0		118	**66**
48.0	**40**	**10**				600.0		128	**71**
50.0	**43**	**11**	3			625.0		139	**78**
55.0	**52**	**13**	4			650.0		150	**84**
60.0	**62**	**15**	5			675.0		162	**90**
65.0	**73**	**18**	6			700.0		175	**97**
70.0	**85**	**21**	7			725.0		187	104
75.0	**97**	**24**	8			750.0		200	112
80.0	111	**27**	9			775.0			119
85.0	125	**31**	**10**			800.0			127
90.0	140	**35**	**11**			825.0			135
95.0	156	**39**	**12**			850.0			143
100.0	173	**43**	**14**			900.0			161
110.0		**52**	**16**	4		925.0			170
120.0		**62**	**20**	5		950.0			179
130.0		**72**	**23**	6		975.0			189
140.0		**84**	**27**	7		1000.0			199
150.0		**96**	**31**	8		1100.0			
160.0		109	**35**	9		1200.0			
170.0		124	**39**	**10**		1300.0			
180.0		138	**44**	**12**	6	1400.0			
190.0		154	**49**	**13**	7	1500.0			
200.0		171	**54**	**14**	8				
220.0			**66**	**17**	**10**				
240.0			**78**	**21**	**11**				
260.0			**92**	**24**	**13**				
280.0			107	**28**	**16**				
Size	2.50"	3.00"	4.00"	5.00"	6.00"	**Size**	4.00"	5.00"	6.00"
FF	7.600	15.297	27.104	52.986	70.972	**FF**	27.104	52.986	70.972

Flow Formulas

GPM = FF x ($\sqrt{DP}$)

DP = $(GPM/FF)^2$

PPL = DP x 0.12

Notes:

1) Accuracy ± 3% of flow rate.
2) Repeatability ± 0.25% of rate.
3) Values in **BOLD** type represents traditional 10" to 100" sizing range.
4) All valves will function above and below ranges shown. Pressure drop and readability should be taken into account.

MANUAL

Differential Pressure Table - *Model Sizes 8" to 16"*

Model MBF / MF, MBG / MG Valves Size 8" - 12" / VF, VG & VW Valves Size 8" - 16"						
Differential Pressure: Inches W.C.						
	Models MBF/MF, MBG/MG VF, VG & VW			**Models MBF/MF, MBG/MG, VF, VG & VW**	**Models VF, VG & VW**	
Flow GPM	**Model Size**		**Flow GPM**	**Model Size**		
	800	**1000**		**1200**	**1400**	**1600**
400.0	**10**		1000.0	7		
425.0	**12**		1100.0	9		
450.0	**14**		1200.0	**10**		
475.0	**16**		1300.0	**12**	7	
500.0	**18**		1400.0	**14**	8	
525.0	**20**		1500.0	**16**	9	
550.0	**22**		1600.0	**19**	**11**	
575.0	**25**		1700.0	**21**	**12**	
600.0	**28**		1800.0	**23**	**13**	
625.0	**31**		1900.0	**26**	**15**	8
650.0	**34**	8	2000.0	**29**	**17**	9
675.0	**37**	9	2200.0	**35**	**20**	**11**
700.0	**40**	**10**	2400.0	**42**	**24**	**13**
725.0	**43**	**11**	2600.0	**49**	**28**	**16**
750.0	**52**	**13**	2800.0	**57**	**33**	**18**
775.0	**62**	**15**	3000.0	**65**	**37**	**21**
800.0	**73**	**18**	3200.0	**74**	**43**	**24**
825.0	**85**	**21**	3400.0	**84**	**48**	**27**
850.0	**97**	**24**	3600.0	**94**	**54**	**30**
875.0	111	**27**	3800.0	105	**60**	**34**
900.0	125	**31**	4000.0	116	**67**	**37**
925.0	140	**35**	4200.0	128	**73**	**41**
950.0	156	**39**	4400.0	140	**81**	**45**
975.0	173	**43**	4500.0		**84**	**47**
1000.0		**52**	4600.0		**88**	**49**
1100.0		**62**	4700.0		**92**	**51**
1200.0		**72**	4800.0		**96**	**54**
1300.0		**84**	5000.0		104	**58**
1400.0		**96**	5200.0			**63**
1500.0		109	5400.0			**68**
1600.0		124	5600.0			**73**
1700.0		138	5800.0			**78**
1800.0		154	6000.0			**84**
1900.0		171	6400.0			**95**
2000.0			6800.0			108
2200.0						
2400.0						
Size	8"	10"	**Size**	12"	14"	16"
FF	130.61	192.54	**FF**	371.4	490.29	655.0

Flow Formulas

GPM = FF x ($\sqrt{DP}$)

$DP = (GPM/FF)^2$

PPL = DP x 0.12

Notes:

1) Accuracy ± 3% of flow rate.
2) Repeatability ± 0.25% of rate.
3) Values in **BOLD** type represents traditional 10" to 100" sizing range.
4) All valves will function above and below ranges shown. Pressure drop and readability should be taken into account.

MANUAL

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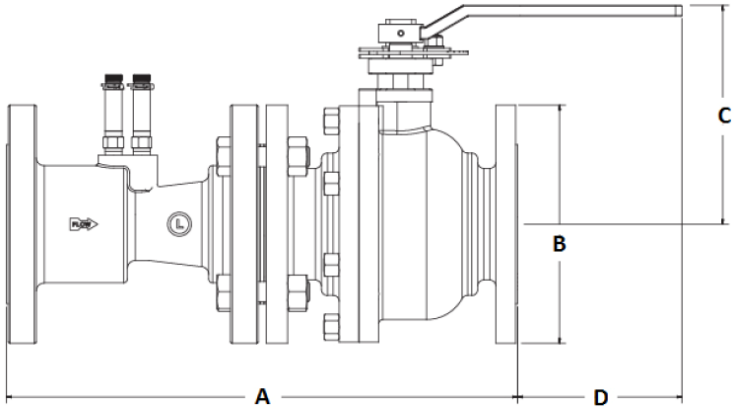
Model MP is a manual balancing valve with featuring a cast steel venturi flow element. The precision machined throat provides measurement accuracy of ±3% of flow rate. Mounted on the discharge is a cast steel ball valve with adjustable flow positioning plate. ANSI 150 flanged end connections, Dual Extended length Pressure/Temperature readout ports and Hanging I.D. Tag.

SPECIFICATIONS

Pressure Ratings:		240 PSI (1654 kPa)
Temperature Ratings:		250ºF (120ºC)
Accuracy:		± 3% of flow rate
Body Material:	Venturi:	Carbon Steel ASTM A-120
End Connections:		ANSI Class 150# Flanged
		Optional ANSI Class 300# Flanged
Metering Ports:		Extended Length Pressure / Temperature test ports
Available Options:		"PTV" combination PT & Air Vent



MANUAL

NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A	B	C	D	Weight	
	in	mm						lbs	kg
MP-250	2.50"	65	in	14.61	7.00	6.10	6.50	49.5	22.5
			mm	371.0	180.0	155.0	165.0		
MP-300	3.00"	75	in	16.12	7.50	7.40	6.00	54.9	24.9
			mm	409.4	190.0	188.0	153.0		
MP-400	4.00"	100	in	18.64	9.0	8.1	7.8	99.5	45.1
			mm	473.5	230.0	206.0	198.0		
MP-500	5.00"	125	in	25.14	10.00	10.00	18.00	146.0	66.2
			mm	638.6	255.0	254.0	457.0		
MP-600	6.00"	150	in	28.14	11.00	11.00	17.50	197.8	89.7
			mm	714.7	280.0	280.0	445.0		

Dimensions not for construction purposes unless certified by factory.

STANDARD COMPONENTS

Pressure / Temperature test port with brass body, dual durometer EPDM core, PTE Extender, brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem. Rated to 500 PSI (3450 kPa) and 275ºF (135ºC)

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

Differential Pressure Table - *Model Sizes 2.50" to 6.00"*

Model MBF / MF, MBG / MG, MP, VF, VG & VW Valves size 2.50" - 6.00"										
Differential Pressure: Inches W.C.										
Flow GPM	**Model Size**					**Flow GPM**	**Model Size**			
	250	300	400	500	600		400	500	600	
24.0	**10**					300.0	123	**32**	**18**	
26.0	**12**					325.0	144	**38**	**21**	
28.0	**14**					350.0	167	**44**	**24**	
30.0	**16**					375.0	191	**50**	**28**	
32.0	**18**					400.0		**57**	**32**	
34.0	**20**					425.0		**64**	**36**	
36.0	**22**					450.0		**72**	**40**	
38.0	**25**					475.0		**80**	**45**	
40.0	**28**					500.0		**89**	**50**	
42.0	**31**					525.0		**98**	**55**	
44.0	**34**	8				550.0		108	**60**	
46.0	**37**	9				575.0		118	**66**	
48.0	**40**	**10**				600.0		128	**71**	
50.0	**43**	**11**	3			625.0		139	**78**	
55.0	**52**	**13**	4			650.0		150	**84**	
60.0	**62**	**15**	5			675.0		162	**90**	
65.0	**73**	**18**	6			700.0		175	**97**	
70.0	**85**	**21**	7			725.0		187	104	
75.0	**97**	**24**	8			750.0		200	112	
80.0	111	**27**	9			775.0			119	
85.0	125	**31**	**10**			800.0			127	
90.0	140	**35**	**11**			825.0			135	
95.0	156	**39**	**12**			850.0			143	
100.0	173	**43**	**14**			900.0			161	
110.0		**52**	**16**	4		925.0			170	
120.0		**62**	**20**	5		950.0			179	
130.0		**72**	**23**	6		975.0			189	
140.0		**84**	**27**	7		1000.0			199	
150.0		**96**	**31**	8		1100.0				
160.0		109	**35**	9		1200.0				
170.0		124	**39**	**10**		1300.0				
180.0		138	**44**	**12**	6	1400.0				
190.0		154	**49**	**13**	7	1500.0				
200.0		171	**54**	**14**	8					
220.0			**66**	**17**	**10**					
240.0			**78**	**21**	**11**					
260.0			**92**	**24**	**13**					
280.0			107	**28**	**16**					
Size	2.50"	3.00"	4.00"	5.00"	6.00"	**Size**	4.00"	5.00"	6.00"	
FF	7.600	15.297	27.104	52.986	70.972	**FF**	27.104	52.986	70.972	

Flow Formulas

GPM = FF x ($\sqrt{DP}$)

DP = $(GPM/FF)^2$

PPL = DP x 0.12

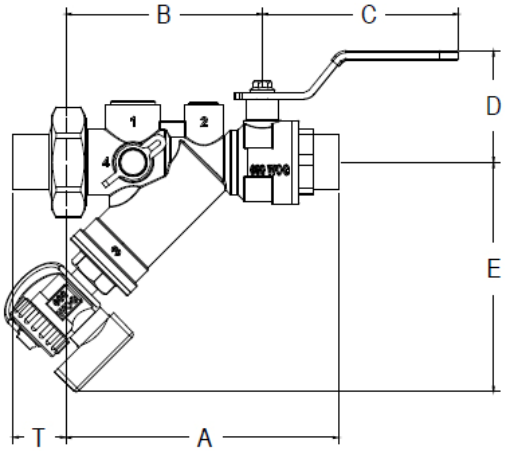
Notes:

1) Accuracy ± 3% of flow rate.
2) Repeatability ± 0.25% of rate.
3) Values in **BOLD** type represents traditional 10" to 100" sizing range.
4) All valves will function above and below ranges shown. Pressure drop and readability should be taken into account.

MANUAL

Model SV
Submittal Data

Model SV is a combination ball valve, wye strainer and union. The 20 mesh stainless steel strainer is removable for cleaning and inspection. The ball valve has a chrome plated ball with Teflon seats, blowout proof stem with double EPDM O-ring seals. The union has an EPDM O-ring seal and tailpiece available in MNPT, FNPT and SWT end connections. Standard features include Pressure/Temperature Port, Hose End Drain Valve and plugged Bypass Port.



SPECIFICATIONS

Pressure Ratings:	600 PSI (4140 kPa)
Temperature Ratings:	250ºF (120ºC)
Body Material:	Forged Brass
End Connections:	Brass - Fixed End: SWT, FNPT Union End: SWT, FNPT & MNPT
Seals:	EPDM
Ball:	Chrome Plated Brass, full port, 100% positive shut-off. *Optional 316 Stainless Steel.*
Stem:	Brass. *Optional 316 Stainless Steel.*
Handle:	Full size Zinc Plated Lever with Vinyl Grip
Available Options:	"PTV" combination PT & Air Vent, Automatic Air Vent, Handle and Port Extensions

NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A		B	C	D	E	*T	Bypass	Flow	WEIGHT	
	in	mm		FNPT	SWT					SWT	Port-In	Range	lbs	kg
SV1e-050	1/2"	15	in	4.74	4.88	2.99	2.33	1.73	3.53	0.83	.50	0.35 to 5.0 GPM	1.90	0.86
			mm	120.60	124.05	79.95	59.26	43.94	89.87	21.08				
SV1e-075	3/4"	20	in	4.77	5.22	2.99	2.33	1.73	3.53	0.98			2.67	1.21
			mm	121.36	132.66	79.95	59.26	43.94	89.87	24.89				
SV1e-100	1"	25	in	4.91	5.60	2.99	2.33	1.73	3.53	0.98			2.02	0.92
			mm	124.79	142.27	79.95	59.26	43.94	89.87	24.89				
SV2e-050	1/2"	15	in	5.71	5.95	3.86	3.66	2.08	3.72	0.92	.75	0.35 to 13.0 GPM	2.57	1.17
			mm	145.24	151.33	98.04	93.01	52.83	94.64	23.37				
SV2e-075	3/4"	20	in	5.75	6.20	3.86	3.66	2.08	3.72	1.43			2.61	1.18
			mm	146.10	157.56	98.04	93.01	52.83	94.64	36.32				
SV2e-100	1"	25	in	5.96	6.36	3.86	3.66	2.08	3.72	1.17			2.69	1.22
			mm	151.59	161.62	98.04	93.01	52.83	94.64	29.72				
SV2e-125	1-1/4"	32	in	6.14	6.69	3.86	3.66	2.08	3.72	1.50			2.92	1.32
			mm	156.03	170.00	98.04	93.01	52.83	94.64	38.10				
SV3-100	1"	25	in	5.11	5.25	3.67	3.66	2.08	3.88	0.92	.75	0.35 to 21.0 GPM	5.41	2.45
			mm	129.79	133.35	93.22	92.96	52.83	98.55	23.37				
SV3-125	1-1/4"	32	in	6.63	6.80	4.94	5.03	2.44	5.62	1.43			5.41	2.45
			mm	168.40	172.72	125.48	127.76	61.98	142.75	36.32				
SV3-150	1-1/2"	40	in	6.63	6.93	4.94	5.03	2.44	5.62	1.17			5.25	2.38
			mm	168.40	176.02	125.48	127.76	61.98	142.75	29.72				
SV4-150	1-1/2"	40	in	9.37	9.91	7.44	5.66	2.83	5.31	1.59	1.25	22.0 to 70.0 GPM	8.72	3.96
			mm	238.00	251.71	188.98	143.76	71.88	134.87	40.38				
SV4-200	2"	50	in	9.56	10.35	7.44	5.66	2.83	5.31	1.50			9.42	4.27
			mm	232.16	262.89	188.98	143.76	71.88	134.87	38.10				

* Please reference the tailpiece data sheet #Bulletin-MB-TP for other sizes and connections.
Dimensions not for construction purposes unless certified by factory.

Components - *Model SV*

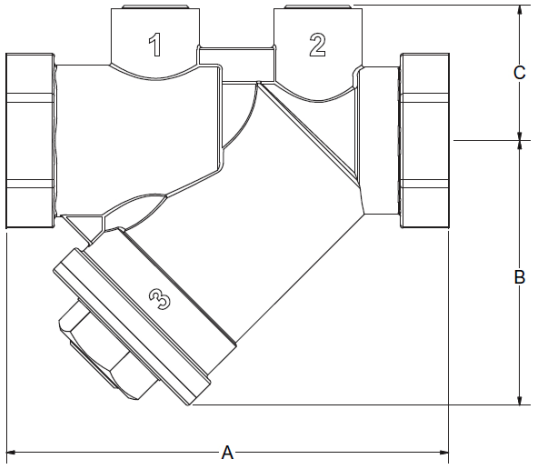
STANDARD COMPONENTS	
	Pressure/Temperature test port with brass body, dual durometer EPDM core, threaded brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem. Rated to 500 PSI (3450 kPa) and 275°F (135°C)
	Drain valve with forged brass body, chrome plated ball, Teflon seats, double EPDM O-ring stem seals, aluminum handle, 3/4" hose connection with cap and plastic retainer strap. Rated to 600 PSI (4140 kPa) WOG and 250°F (121°C)
Please reference data sheet #Bulletin-MB-Accessories for optional accessories.	

STRAINERS

Model ST is a wye strainer with dual 0.25" plugged accessory ports and FNPT end connections. The 20 mesh stainless steel strainer is removable for cleaning and inspection.

SPECIFICATIONS

Pressure Ratings:	400 PSI (2758 kPa)
Temperature Ratings:	250ºF (120ºC)
Body Material:	DZR Brass
End Connections:	FNPT, Inlet and Outlet
Seals:	EPDM
Strainer:	20 Mesh Stainless Steel
Available Options:	"PT" Pressure/Temperature Port, "PTV" combination PT & Air Vent, Automatic Air Vent, Hose End Drain Valve and Port Extensions

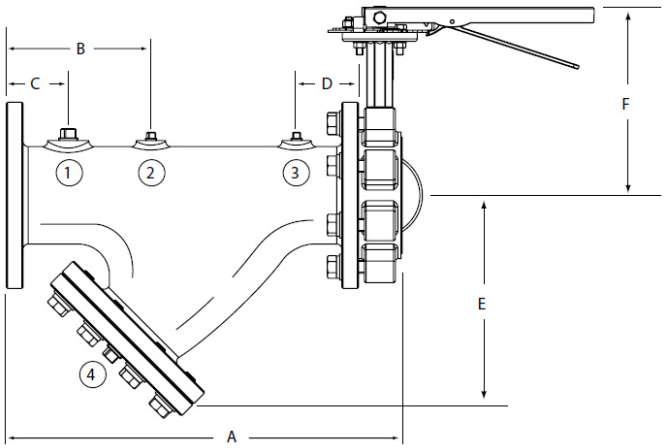


STRAINERS

NOMINAL DIMENSIONS & WEIGHTS								
MODEL	SIZE			A	B	C	WEIGHT	
	in	mm					lbs	kg
ST-050	1/2"	15	in	3.43	2.15	1.10	0.98	0.44
			mm	87.10	54.60	27.90		
ST-075	3/4"	20	in	3.60	2.15	1.10	1.04	0.47
			mm	91.40	54.60	27.90		
ST-100	1"	25	in	3.92	2.15	1.10	1.20	0.54
			mm	99.60	54.60	27.90		
* Please reference the tailpiece data sheet #Bulletin-MB-TP for other sizes and connections. ***Dimensions not for construction purposes unless certified by factory.***								
Please reference data sheet #Bulletin-MB-Accessories for optional accessories.								

Model SVF
Submittal Data

Model SVF is a combination strainer valve featuring a cast iron wye strainer with removable stainless steel strainer screen, bolted cover with blow down connection and ANSI 125# Flanged End Connections. Mounted on the inlet is a ductile iron lug type butterfly valve. Strainer body features three threaded accessory ports.



SPECIFICATIONS

Pressure Ratings:	175 PSIG (2775 kPa)
Temperature Ratings:	250ºF (120ºC)
Strainer Body Material:	Cast Iron ASTM A 126 Class B
Screen:	S/S Type 304, ASTM A 167
Screen Opening:	2" - 6" 0.045 perf. 8" - 12" 0.125 perf.
Cover Gasket:	Fiber
End Connections:	Flanged ANSI 125# drilling
Butterfly Valve:	Ductile ASTM A 536 64-45-12
Disc:	Aluminum Bronze ASTM B 148 C 95400
Seat:	EPDM
Bushing:	Teflon Fiberglass Backed
Seal:	EPDM
Stem:	Stainless Steel 416 ASTM A582
Available Options:	"PT" Pressure/Temperature Port, "PTV" combination PT & Air Vent and "DV" Drain Valve

STRAINERS

NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A	B	C	D	E	F	1	2	3	4	WEIGHT	
	in	mm								NPT	NPT	NPT	NPT	lbs	kg
SVF-250	2.5"	65	in	13.18	5.00	3.00	3.00	7.60	8.15	0.75"	0.25"	0.25"	1.00"	49.0	22.23
			mm	334.77	127.00	76.20	76.20	193.00	207.00						
SVF-300	3.0"	75	in	14.40	6.00	3.00	3.00	8.30	8.39	0.75"	0.25"	0.25"	1.00"	58.0	26.31
			mm	365.76	152.40	76.20	76.20	210.80	213.00						
SVF-400	4.0"	100	in	17.04	7.00	3.00	3.00	10.10	9.13	0.75"	0.25"	0.25"	1.25"	91.0	41.28
			mm	432.82	177.80	76.20	76.20	256.50	232.00						
SVF-500	5.0"	125	in	20.25	9.00	3.50	3.50	11.90	9.65	0.75"	0.25"	0.25"	1.25"	145.0	65.77
			mm	514.35	228.60	88.90	88.90	302.30	245.00						
SVF-600	6.0"	150	in	22.69	10.00	4.00	4.00	17.40	10.16	0.75"	0.25"	0.25"	1.50"	179.0	81.19
			mm	576.33	254.00	101.60	101.60	442.00	258.00						
SVF-800	8.0"	200	in	26.39	12.00	4.00	4.00	17.40	13.50	0.75"	0.25"	0.25"	1.50"	328.0	148.78
			mm	670.31	304.80	101.60	101.60	441.96	343.00						
SVF-1000	10.0"	250	in	32.08	15.00	5.00	5.00	20.88	14.75	0.75"	0.25"	0.25"	2.00"	530.0	240.40
			mm	814.83	367.50	127.00	127.00	530.35	375.00						
SVF-1200	12.0"	300	in	36.78	17.00	5.00	5.00	23.31	16.50	0.75"	0.25"	0.25"	2.00"	714.0	323.87
			mm	934.21	431.80	127.00	127.00	592.00	419.00						

Dimensions not for construction purposes unless certified by factory.

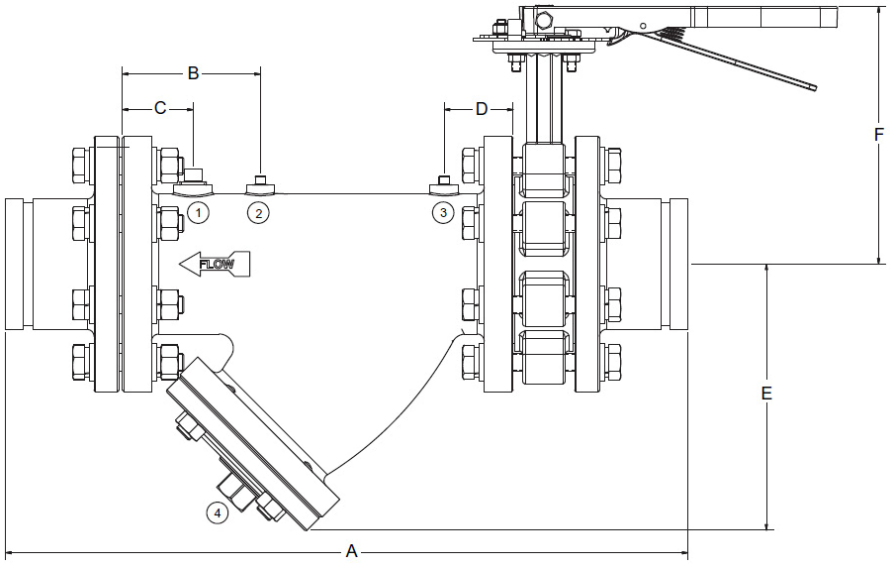
Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

Tunstall Corporation
118 Exchange Street · Chicopee, MA 01013
Phone (413) 594-8695 · Fax (413) 598-8109

2.50”- 12.00" SG Cast Iron Strainer & Butterfly Valve

(Model SVF With Groove x Flanged Adaptors)



STRAINERS

NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A	B	C	D	E	F	1	2	3	4	WEIGHT	
	in	mm								NPT	NPT	NPT	NPT	lbs	kg
SVF-250	2.5”	65	in	13.18	5.00	3.00	3.00	7.60	8.15	0.75”	0.25”	0.25”	1.00”	49.0	22.23
			mm	334.77	127.00	76.20	76.20	193.00	207.00						
SVF-300	3.0”	75	in	14.40	6.00	3.00	3.00	8.30	8.39	0.75”	0.25”	0.25”	1.00”	58.0	26.31
			mm	365.76	152.40	76.20	76.20	210.80	213.00						
SVF-400	4.0”	100	in	17.04	7.00	3.00	3.00	10.10	9.13	0.75”	0.25”	0.25”	1.25”	91.0	41.28
			mm	432.82	177.80	76.20	76.20	256.50	232.00						
SVF-500	5.0”	125	in	20.25	9.00	3.50	3.50	11.90	9.65	0.75”	0.25”	0.25”	1.25”	145.0	65.77
			mm	514.35	228.60	88.90	88.90	302.30	245.00						
SVF-600	6.0”	150	in	22.69	10.00	4.00	4.00	17.40	10.16	0.75”	0.25”	0.25”	1.50”	179.0	81.19
			mm	576.33	254.00	101.60	101.60	442.00	258.00						
SVF-800	8.0”	200	in	26.39	12.00	4.00	4.00	17.40	13.50	0.75”	0.25”	0.25”	1.50”	328.0	148.78
			mm	670.31	304.80	101.60	101.60	441.96	343.00						
SVF-1000	10.0”	250	in	32.08	15.00	5.00	5.00	20.88	14.75	0.75”	0.25”	0.25”	2.00”	530.0	240.40
			mm	814.83	367.50	127.00	127.00	530.35	375.00						
SVF-1200	12.0”	300	in	36.78	17.00	5.00	5.00	23.31	16.50	0.75”	0.25”	0.25”	2.00”	714.0	323.87
			mm	934.21	431.80	127.00	127.00	592.00	419.00						

Dimensions not for construction purposes unless certified by factory.

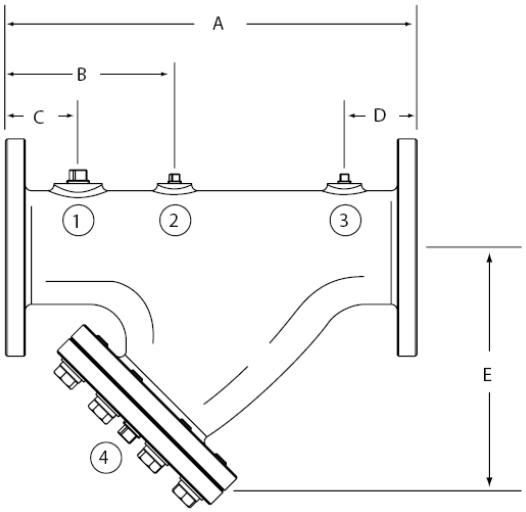
Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

www.maconbalancing.com

Tunstall Corporation
118 Exchange Street · Chicopee, MA 01013
Phone (413) 594-8695 · Fax (413) 598-8109

Model SF is strainer valve featuring a cast iron wye strainer with removable stainless steel strainer screen, bolted cover with blow down connection and ANSI 125# Flanged End Connections.
Strainer body features three threaded accessory ports.



SPECIFICATIONS

Pressure Ratings:	175 PSIG (2775 kPa)
Temperature Ratings:	250ºF (120ºC)
Strainer Body Material:	Cast Iron ASTM A 126 Class B
Screen:	S/S Type 304, ASTM A 167
Screen Opening:	2" - 6" 0.045 perf.
	8" - 12" 0.125 perf.
Cover Gasket:	Fiber
End Connections:	Flanged ANSI 125# drilling
Available Options:	"PT" Pressure/Temperature Port, "PTV" combination PT & Air Vent and "DV" Drain Valve

STRAINERS

NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A	B	C	D	E	1	2	3	4	WEIGHT	
	in	mm							NPT	NPT	NPT	NPT	lbs	kg
SF-200	2.0"	50	in	9.87	5.00	2.50	2.50	5.68	0.75"	0.25"	0.25"	0.50"	22.0	9.98
			mm	250.80	127.00	63.50	63.50	144.30						
SF-250	2.5"	65	in	13.18	5.00	3.00	3.00	7.60	0.75"	0.25"	0.25"	1.00"	49.0	22.23
			mm	334.77	127.00	76.20	76.20	193.00						
SF-300	3.0"	75	in	14.40	6.00	3.00	3.00	8.30	0.75"	0.25"	0.25"	1.00"	58.0	26.31
			mm	365.76	152.40	76.20	76.20	210.80						
SF-400	4.0"	100	in	17.04	7.00	3.00	3.00	10.10	0.75"	0.25"	0.25"	1.25"	91.0	41.28
			mm	432.82	177.80	76.20	76.20	256.50						
SF-500	5.0"	125	in	20.25	9.00	3.50	3.50	11.90	0.75"	0.25"	0.25"	1.25"	145.0	65.77
			mm	514.35	228.60	88.90	88.90	302.30						
SF-600	6.0"	150	in	22.69	10.00	4.00	4.00	17.40	0.75"	0.25"	0.25"	1.50"	179.0	81.19
			mm	576.33	254.00	101.60	101.60	442.00						
SF-800	8.0"	200	in	26.39	12.00	4.00	4.00	17.40	0.75"	0.25"	0.25"	1.50"	328.0	148.78
			mm	670.31	304.80	101.60	101.60	441.96						
SF-1000	10.0"	250	in	32.08	15.00	5.00	5.00	20.88	0.75"	0.25"	0.25"	2.00"	530.0	240.40
			mm	814.83	367.50	127.00	127.00	530.35						
SF-1200	12.0"	300	in	36.78	17.00	5.00	5.00	23.31	0.75"	0.25"	0.25"	2.00"	714.0	323.87
			mm	934.21	431.80	127.00	127.00	592.00						

Dimensions not for construction purposes unless certified by factory.

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

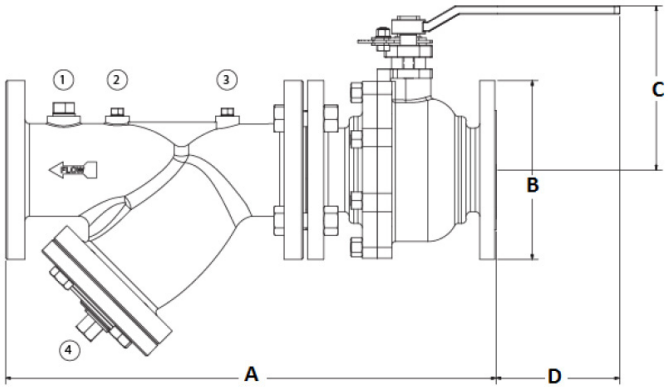
Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

Tunstall Corporation
118 Exchange Street · Chicopee, MA 01013
Phone (413) 594-8695 · Fax (413) 598-8109

Model SP is a combination strainer valve with a "Y" (wye) strainer with removable stainless steel strainer screen, bolted cover with blow down connection and ANSI 125# Flanged End Connections. Mounted on the inlet is a cast steel Ball Valve with adjustable flow positioning plate. Strainer body features three threaded accessory ports.

SPECIFICATIONS

Pressure Ratings:	175 PSIG (2775 kPa)
Temperature Ratings:	250ºF (120ºC)
Strainer Body Material:	2.5" - 4" Ductile Iron 5" - 6" Cast Iron ASTM A 126 Class B
Screen:	S/S Type 304, ASTM A 167
Screen Opening:	2.5" - 4" 0.045 perf.
Cover Gasket:	Fiber
End Connections:	ANSI 125# Flanged
Ball Valve Body:	Cast Steel
Ball:	304 Stainless Steel
Stem:	304 Stainless Steel
Seat:	Teflon
End Connections:	ANSI 150# Flanged
Bushing:	Teflon Fiberglass Backed
Seal:	EPDM
Available Options:	"PT" Pressure/Temperature Port, "PTV" combination PT & Air Vent and "DV" Drain Valve



STRAINERS

NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE			A	B	C	D	1	2	3	4	WEIGHT	
	in	mm						NPT	NPT	NPT	NPT	lbs	kg
SVF-250	2.5"	65	in	18.86	7.00	6.10	6.50	0.75"	0.25"	0.25"	1.00"	49.5	22.5
			mm	479	180	155	165						
SVF-300	3.0"	75	in	20.62	7.50	7.40	6.00	0.75"	0.25"	0.25"	1.00"	54.9	24.9
			mm	524	190	188	153						
SVF-400	4.0"	100	in	24.00	9.00	8.10	7.80	0.75"	0.25"	0.25"	1.25"	99.5	45.1
			mm	610	230	206	198						
SVF-500	5.0"	125	in	32.08	10.00	10.00	17.00	0.75"	0.25"	0.25"	1.25"	146.0	66.2
			mm	815	254	254	432						
SVF-600	6.0"	150	in	36.00	11.00	11.00	17.50	0.75"	0.25"	0.25"	1.50"	197.8	89.7
			mm	915	279	279	445						

Dimensions not for construction purposes unless certified by factory.

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

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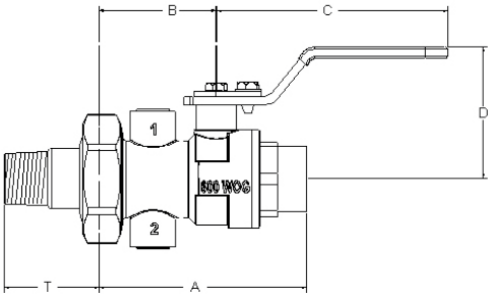
Model BB

Submittal Data

Model BB Union End Ball Valve is offers shutoff and throttling. The position indicating Memory Stop provides quick and easy flow setting with a single screw adjustment. The ball valve has a chrome plated ball, Teflon seats, a blowout proof stem with double EPDM O-ring seals and dual plugged accessory ports. The union has an EPDM O-ring seal and tailpiece available in MNPT, FNPT, and SWT end connections.



SPECIFICATIONS

Pressure Ratings:	600 PSI (4140 kPa)
Temperature Ratings:	250ºF (121ºC)
Body Material:	Forged Brass
End Connections:	Brass - Fixed End: SWT, FNPT Union End: SWT, FNPT & MNPT
Seals:	EPDM
Ball:	Chrome Plated Brass, full port, 100% positive shut-off. *Optional 316 Stainless Steel.*
Stem:	Brass. *Optional 316 Stainless Steel.*
Handle:	Full size Zinc Plated lever with Vinyl Grip
Memory Stop:	Zinc Plated Steel with position indicator
Available Options:	"PTV" combination PT & Air Vent, hose end Drain Valve & Port Extensions

NOMINAL DIMENSIONS & WEIGHTS

SIZE			A		B	C	D	*T	WEIGHT	
in	mm		FNPT	SWT				MPT	lbs	kg
1/2"	15	in	3.19	3.29	2.03	3.66	1.98	1.50	1.21	0.55
		mm	81.03	83.49	51.64	92.96	50.50	38.10		
3/4" R	20	in	3.34	3.41	2.03	3.66	1.98	1.50	1.25	0.57
		mm	84.84	86.61	51.64	92.96	50.50	38.10		
3/4"	20	in	3.33	3.45	2.03	3.66	2.08	1.56	1.47	0.67
		mm	84.58	87.63	51.64	92.96	52.83	39.70		
1" R	25	in	3.48	3.61	2.03	3.66	2.08	1.80	1.55	0.70
		mm	88.39	91.69	51.64	92.96	56.31	45.72		
1-1/4"	32	in	4.02	4.19	2.33	5.03	2.44	1.80	3.43	1.56
		mm	101.11	106.43	59.18	127.76	61.90	45.72		
1-1/2"	40	in	4.44	4.74	2.52	5.65	2.83	1.80	4.75	2.15
		mm	112.78	120.40	64.00	143.59	71.81	45.72		
2" R	50	in	5.03	5.82	2.90	5.65	2.83	1.98	5.68	2.58
		mm	127.76	148.83	73.66	143.59	78.56	50.17		

* Please reference the tailpiece data sheet #Bulletin-MB-TP for other sizes and connections.
Dimensions not for construction purposes unless certified by factory.

STANDARD COMPONENTS

Memory stop with position indicator, zinc coated steel.

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

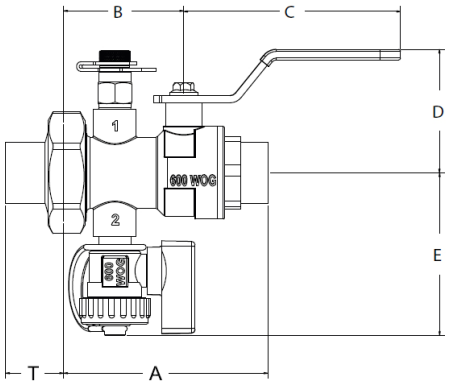
SHUT OFF VALVES

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

MACON® BALANCING

Model SB
Submittal Data

Model SB Union End Ball Valve offers positive shut-off, pressure/temperature measurement and drain. The ball valve has a chrome plated ball with Teflon seats, blowout proof stem with double EPDM O-ring seals. The union has an EPDM O-ring seal and tailpiece available in MNPT, FNPT and SWT end connections.
Standard features include Pressure/Temperature Port and Hose End Drain Valve.



SPECIFICATIONS

Pressure Ratings:	600 PSI (4140 kPa)
Temperature Ratings:	250ºF (121ºC)
Body Material:	Forged Brass
End Connections:	Brass - Fixed End: SWT, FNPT Union End: SWT, FNPT & MNPT
Seals:	EPDM
Ball:	Chrome Plated Brass, full port, 100% positive shut-off. *Optional 316 Stainless Steel.*
Stem:	Brass. *Optional 316 Stainless Steel.*
Handle:	Full size Zinc Plated Lever with Vinyl Grip
Available Options:	"PTV" combination PT & Air Vent, Hose End Drain Valve, Handle and Port Extensions

NOMINAL DIMENSIONS & WEIGHTS

SIZE			A		B	C	D	E	*T	WEIGHT	
in	mm		FNPT	SWT					SWT	lbs	kg
1/2"	15	in	3.19	3.29	2.03	3.66	1.98	2.53	0.83	1.45	0.66
		mm	81.03	83.57	51.56	92.96	50.29	64.26	21.08		
3/4" R	20R	in	3.34	3.41	2.03	3.66	1.98	2.53	0.98	1.45	0.66
		mm	84.84	86.61	51.56	92.96	50.29	64.26	24.89		
3/4"	20	in	3.33	3.45	2.03	3.66	2.08	2.74	0.98	1.73	0.78
		mm	84.58	87.63	51.56	92.93	52.83	69.60	24.89		
1" R	25 R	in	3.48	3.61	2.03	3.66	2.08	2.74	0.92	1.73	0.78
		mm	88.39	91.69	51.56	92.96	52.83	69.60	23.27		
1-1/4"	32	in	4.02	4.19	2.33	5.03	2.22	3.12	0.92	3.73	1.69
		mm	101.11	106.43	59.18	127.76	61.98	79.25	36.32		
1-1/2"	40	in	4.44	4.74	2.52	5.66	2.83	3.12	1.17	4.86	2.20
		mm	112.78	120.40	64.00	143.76	71.88	79.25	29.72		
2"	50	in	5.03	5.82	2.90	5.66	2.83	3.51	1.50	5.72	2.60
		mm	127.76	148.83	73.66	143.76	71.88	89.15	38.10		

* Please reference the tailpiece data sheet #Bulletin-MB-TP for other sizes and connections.
Dimensions not for construction purposes unless certified by factory.

STANDARD COMPONENTS

Pressure/Temperature test port with brass body, dual durometer EPDM core, threaded brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem.
Rated to 500 PSI (3450 kPa) and 275°F (135°C)

Drain valve with forged brass body, chrome plated ball, Teflon seats, double EPDM O-ring stem seals, aluminum handle, 3/4" hose connection with cap and plastic retainer strap.
Rated to 600 PSI (4140 kPa) WOG and 250°F (121°C)

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

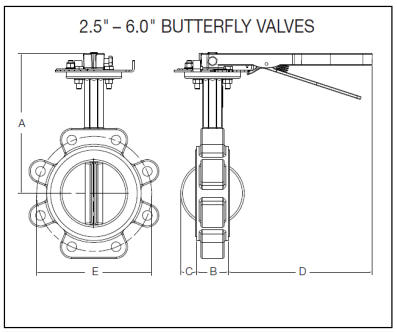
SHUT OFF VALVES

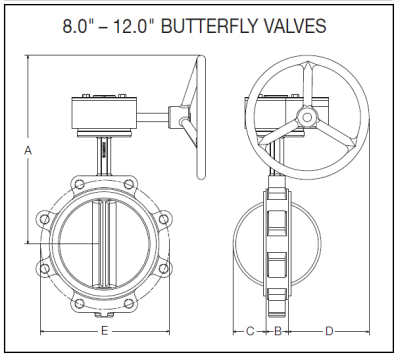
MACON® BALANCING

Model BVF

Submittal Data

Model BVF Butterfly Valves are Lug Type. The heavy duty, one piece body is designed to be installed between all types of ANSI 125 / 150 flanges. Resilient seat provides bubble tight shut off. Blowout proof stem with pinned disc. Universal mounting flange conforms to ISO-5211. The 2.5" through 6.0" sizes are supplied with an adjustable flow positioning plate. This unique design provides quick and easy setting of the valve flow position, requires less hardware, will not slip and allows the valve to be easily moved to the closed or full open position without disturbing the flow positioning set point. The 8.0" through 12.0" size Butterfly Valves feature a gear operator.





SPECIFICATIONS

Pressure Ratings:	200 PSIG (13.80 BAR)
Temperature Ratings:	250ºF (121ºC)
Body Material:	Ductile Iron ASTM A 536 65-45-12
Disc:	Aluminum Bronze ASTM B 148 C 95400
Shaft:	Stainless Steel 416 ASTM A582
Seat:	EPDM
Bushing:	Teflon
Seal:	EPDM
Pin:	Stainless Steel

NOMINAL DIMENSIONS & WEIGHTS

MODEL	SIZE		A	B	C	D	E	WEIGHT	
								lbs	kg
BVF-250	in	2.5"	8.15	1.93	0.30	9.39	5.50	9.5	4.31
	mm	65	207	49.1	7.6	238.5	139.7		
BVF-300	in	3.0"	8.39	1.90	0.60	9.41	6.00	10.6	4.81
	mm	80	213	48.4	15.2	239	152.4		
BVF-400	in	4.0"	9.13	2.17	0.96	9.27	7.50	17.2	7.80
	mm	100	232	55.3	21.35	235.5	190.5		
BVF-500	in	5"	9.65	2.31	1.27	9.20	8.50	22.7	10.30
	mm	125	245	58.8	32.25	233.7	215.9		
BVF-600	in	6"	10.16	2.32	1.90	9.20	9.50	27.1	12.29
	mm	150	258	59.1	48.3	233.7	241.3		
BVF-800	in	8"	17.44	2.38	2.79	7.00	11.75	57.5	26.08
	mm	200	443	60.5	70.92	177.7	298.4		
BVF-1000	in	10"	18.70	2.67	3.59	6.85	14.25	84.0	38.10
	mm	250	475	68.0	91.21	174	361.9		
BVF-1200	in	12"	20.59	3.02	4.42	7.42	17.00	135.8	61.60
	mm	300	523	76.9	112.3	188.55	431.8		

PERFORMANCE
Cv VALUES (GPM@1 PSID) - DISC POSITION (DEGREES)

MODEL	10º	20º	30º	40º	50º	60º	70º	80º	90º
BVF-250	0.2	8	20	37	65	98	144	204	220
BVF-300	0.3	12	22	39	70	116	183	275	302
BVF-400	0.5	17	36	78	139	230	364	546	600
BVF-500	0.8	29	61	133	237	392	620	930	1022
BVF-600	2	45	95	205	366	605	958	1437	1579
BVF-800	3	89	188	408	727	1202	1903	2854	3136
BVF-1000	4	151	320	694	1237	2047	3240	4859	5340
BVF-1200	5	234	495	1072	1911	3162	5005	7507	8250

SHUT OFF VALVES

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

www.maconbalancing.com

Tunstall Corporation
118 Exchange Street · Chicopee, MA 01013
Phone (413) 594-8695 · Fax (413) 598-8109

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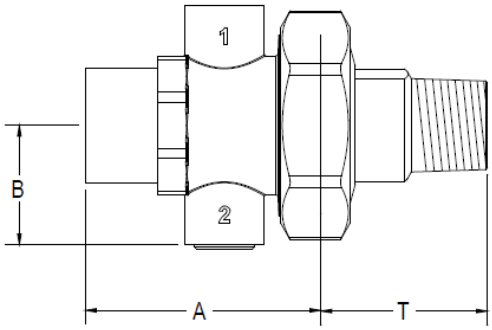
SHUT OFF VALVES

Model BB Union offers numerous End Connections with two 1/4" plugged accessory ports. The union has an EPDM O-ring seal and Fixed End Connections available in FNPT or SWT. Tailpiece connections are available in MNPT, FNPT, and SWT.

SPECIFICATIONS

Pressure Ratings:	600 PSI (4140 kPa)
Temperature Ratings:	250ºF (120ºC)
Body Material:	Forged Brass
End Connections:	Brass - Fixed End: SWT, FNPT Union End: SWT, FNPT & MNPT
Seals:	EPDM
Available Options:	Hose End Drain Valve

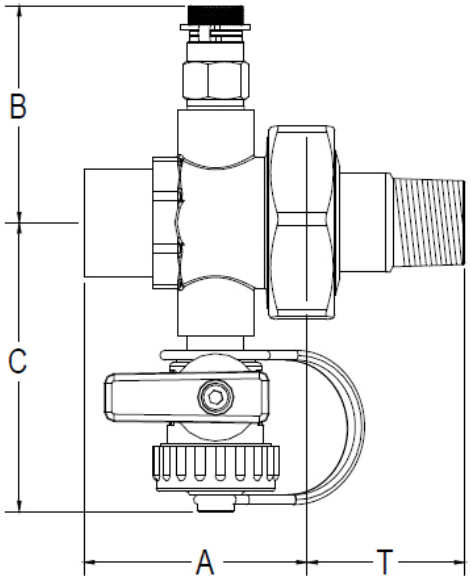


NOMINAL DIMENSIONS & WEIGHTS

SIZE			A		B	*T	WEIGHT	
in	mm		FNPT	SWT		MNPT	lbs	kg
3/8"	10	in	N/A	1.86	.84	N/A	0.56	0.25
		mm	N/A	47.29	21.34	N/A		
1/2"	15	in	1.90	1.88	.84	1.50	0.59	0.27
		mm	48.26	47.75	21.34	38.10		
3/4" R SWT	20 SWT	in	1.98	2.12	.84	1.55	0.59	0.27
		mm	50.29	53.85	21.34	39.37		
3/4" FNPT	20 FNPT	in	1.98	2.12	1.08	1.56	0.82	0.37
		mm	50.29	53.82	27.43	39.62		
1"	25	in	2.15	2.28	1.08	1.75	0.90	0.41
		mm	54.61	57.91	27.43	44.45		
1-1/4"	32	in	2.39	2.56	1.46	1.80	1.82	0.83
		mm	60.71	65.02	37.08	45.72		
1-1/2"	40	in	2.39	2.69	1.46	1.80	1.91	0.87
		mm	60.71	68.32	37.08	45.72		
2"	50	in	2.49	3.03	1.76	1.98	2.79	1.27
		mm	63.25	76.96	44.70	50.29		

* Please reference the tailpiece data sheet #Bulletin-MB-TP for other sizes and connections.
Dimensions not for construction purposes unless certified by factory.

Model US Union offers numerous end connections pressure/temperature measurement and drain. The union has an EPDM O-ring seal and tailpiece available in MNPT, FNPT and SWT end connections.
Standard features include Pressure/Temperature Port and Hose End Drain Valve.



SPECIFICATIONS

Pressure Ratings:	600 PSI (4140 kPa)
Temperature Ratings:	250ºF (121ºC)
Body Material:	Forged Brass
End Connections:	Brass - Fixed End: SWT, FNPT Union End: SWT, FNPT & MNPT
Seals:	EPDM
Available Options:	"PTV" combination PT & Air Vent and Port Extensions

NOMINAL DIMENSIONS & WEIGHTS

SIZE			A		B	C	*T	WEIGHT	
in	mm		FNPT	SWT			MNPT	lbs	kg
3/8"	10	in	N/A	1.86	2.52	1.83	0.75	0.94	0.43
		mm	N/A	47.24	64.00	46.48	19.05		
1/2"	15	in	1.99	1.88	2.52	1.83	0.38	1.04	0.49
		mm	50.47	47.68	64.00	46.48	21.08		
3/4" R	20R	in	2.04	2.12	2.75	2.07	0.98	0.97	0.44
		mm	51.82	53.90	69.85	52.56	24.89		
3/4"	20	in	2.04	2.12	2.52	1.83	0.98	1.24	0.56
		mm	51.82	53.90	64.00	46.48	24.89		
1"	25	in	2.15	2.28	2.75	2.07	0.92	1.39	0.69
		mm	54.56	57.85	69.85	52.56	23.37		
1-1/4"	32	in	2.39	2.56	3.11	2.45	1.43	2.48	1.18
		mm	60.63	65.05	78.99	62.23	36.32		
1-1/2"	40	in	2.39	2.69	3.11	2.48	1.17	2.79	1.33
		mm	60.63	68.35	78.99	60.96	29.72		
2"	50	in	2.49	3.03	3.43	2.75	1.50	3.77	1.82
		mm	63.30	76.96	87.12	69.85	38.10		

* Please reference the tailpiece data sheet #Bulletin-MB-TP for other sizes and connections.
Dimensions not for construction purposes unless certified by factory.

STANDARD COMPONENTS

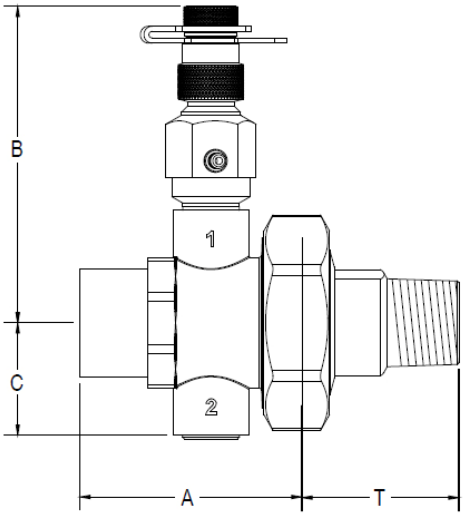
Pressure/Temperature test port with brass body, dual durometer EPDM core, threaded brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem.
Rated to 500 PSI (3450 kPa) and 275°F (135°C)

Drain valve with forged brass body, chrome plated ball, Teflon seats, double EPDM O-ring stem seals, aluminum handle, 3/4" hose connection with cap and plastic retainer strap.
Rated to 600 PSI (4140 kPa) WOG and 250°F (121°C)

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

UNIONS

Model URP Union offers numerous End Connections pressure/temperature measurement and vent. The union has an EPDM O-ring seal and tailpiece available in MNPT, FNPT and SWT end connections.
Standard features include "PTV" Combination PT and Air Vent.



SPECIFICATIONS

Pressure Ratings:	600 PSI (4140 kPa)
Temperature Ratings:	250ºF (121ºC)
Body Material:	Forged Brass
End Connections:	Brass - Fixed End: SWT, FNPT Union End: SWT, FNPT & MNPT
Seals:	EPDM
Available Options:	Hose End Drain Valve and Port Extensions

NOMINAL DIMENSIONS & WEIGHTS

SIZE			A		B	C	*T	WEIGHT	
in	mm		FNPT	SWT			MNPT	lbs	kg
3/8"	10	in	N/A	1.88	2.78	0.87	N/A	0.76	035
		mm	N/A	47.68	70.61	22.10	N/A		
1/2"	15	in	1.99	1.88	2.78	0.87	1.50	0.86	0.39
		mm	50.47	47.68	70.25	22.10	38.10		
3/4" R	20	in	2.04	2.12	2.78	0.87	1.55	0.79	0.36
		mm	51.82	53.90	70.61	22.10	39.37		
3/4"	20	in	2.04	2.12	3.02	1.11	1.56	1.06	0.48
		mm	51.82	53.90	76.65	28.19	39.70		
1"	25	in	2.15	2.28	3.02	1.11	1.75	1.16	0.53
		mm	54.56	57.85	76.65	28.19	44.72		
1-1/4"	32	in	2.39	2.56	3.39	1.49	1.80	2.20	1.00
		mm	60.63	65.05	86.18	36.98	45.72		
1-1/2"	40	in	2.39	2.69	3.39	1.49	1.80	2.42	1.10
		mm	60.63	68.35	86.18	36.98	45.72		
2"	50	in	2.49	3.03	3.70	1.80	1.98	3.42	1.55
		mm	63.30	76.96	94.08	44.75	50.17		

* Please reference the tailpiece data sheet #Bulletin-MB-TP for other sizes and connections.
Dimensions not for construction purposes unless certified by factory.

Combination manual air vent and pressure/temperature test port with brass body, dual durometer EPDM core, blowout-proof stem, side discharge vent with 1/8" (4mm) hose barb, threaded brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem. Rated to 250 PSI (1725 kPa) and 250°F (121°C)

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

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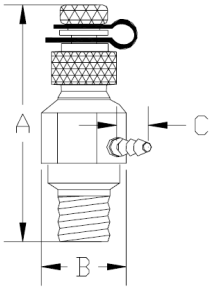
PTV - PRESSURE / TEMPERATURE VENT

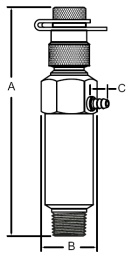


PATENT #6899317

Combination manual air vent and pressure/temperature test port with brass body, dual durometer EPDM core, blowout-proof stem, side discharge vent with 1/8" (4mm) hose barb, threaded brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem.
Rated to 250 PSI (1725 kPa) and 250°F (120°C).

MODEL	NPT CONN		A	B	C	WRENCH SIZE	WEIGHT	
							lbs	kg
PTV-025	1/4"	in	1.50	0.84	0.32	3/4"	0.154	0.07
		mm	40	21	9			
PTV-050	1/2"	in	1.50	0.98	0.32	3/4"	0.225	0.10
		mm	0.98	25	9			

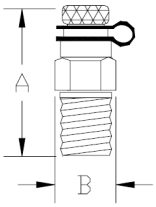
EPTV - EXTENDED PRESSURE / TEMPERATURE VENT



Extended combination manual air vent and pressure/temperature test port with brass body, dual durometer EPDM core, blowout-proof stem, side discharge vent with 1/8" (4mm) hose barb, threaded brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem.
Rated to 250 PSI (1725 kPa) and 250°F (120°C).

MODEL	NPT CONN		A	B	C	WRENCH SIZE	WEIGHT	
							lbs	kg
EPTV-025	1/4"	in	3.60	0.87	0.31	3/4"	0.28	0.12
		mm	91	21	8			

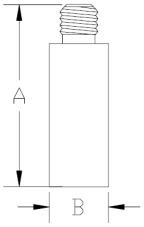
PT - PRESSURE / TEMPERATURE PORT



Pressure/Temperature test port with brass body, dual durometer EPDM core, brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem.
Rated to 500 PSI (3450 kPa) and 275°F (135°C).

MODEL	NPT CONN		A	B	WRENCH SIZE	WEIGHT	
						lbs	kg
PT-025	1/4"	in	1.36	0.65	9/16"	0.06	0.03
		mm	34	16			
PT-050	1/2"	in	1.36	1.01	7/8"	0.18	0.08
		mm	34	25			

PTE - PTV / PT EXTENDER



Single and Dual Extender for PTV and PT models, used on insulated piping systems or where extended length is desired. The PTE is installed above the PTV or PT core with an O-ring seal. The PTE can be installed in the field without removing the PTV or PT from the piping system. Brass body with EPDM O-ring seal.
Rated to 500 PSI (3450 kPa) and 250 ° F (120 ° C).

MODEL		A	B	WEIGHT	
				lbs	kg
PTE-025 One	in	1.59	0.54	0.90	0.04
	mm	41	14		
PTE-025 Two	in	1.59	0.54	0.90	0.04
	mm	41	14		

ACCESSORIES

EH - EXTENDED HANDLE

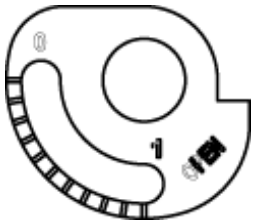
Handle Extension, forged brass stem & collar, for extending existing handle 2".

MODEL	FITS
EH-1	1/2", 3/4", & 1"R, AB, BB, MB, SB, SV, 1" SV
EH-2	1" & 1-1/4" AB, BB, MB, SB, 1-1/4" & 1-1/2" SV, AB
EH-3	1-1/2" & 2" BB,MB,SB, 2" SV, AB

SH - SHORT LEVER HANDLE

Short lever valve handle, zinc plated steel.

MS - MEMORY STOP



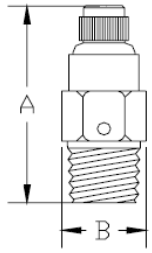
Memory stop, Zinc plated steel with position indicator and position lock screw.
For use with valve handles.

SSBS - STAINLESS STEEL BALL & STEM

316 Stainless Steel Ball & Stem.
Available in 1/2" - 2"

ACCESSORIES

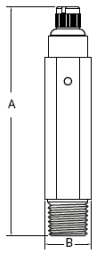
MAV - MANUAL AIR VENT



Manual air vent with brass body, knurled operator with screwdriver slot, blowout-proof stem, and side discharge vent.
Rated to 400 PSI (2760 kPa) and 250°F (120°C).

MODEL	NPT CONN		A	B	WRENCH SIZE	WEIGHT	
						lbs	kg
MAV-025	1/4”	in	1.75	0.625	9/16”	0.80	0.36
		mm	44	16			

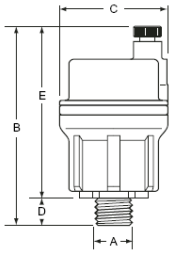
EMAV - EXTENDED MANUAL AIR VENT



Extended manual air vent with brass body, knurled operator with screwdriver slot, blowout-proof stem, and side discharge vent.
Rated to 400 PSI (2760 kPa) and 250°F (120°C).

MODEL	NPT CONN		A	B	WRENCH SIZE	WEIGHT	
						lbs	kg
MAV-025	1/4”	in	1.75	0.62	9/16”	0.80	0.36
		mm	44	16			

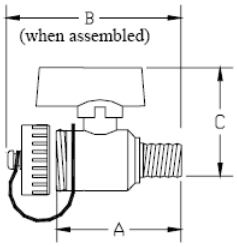
AAV - AUTOMATIC AIR VENT



Automatic air vent with brass body, plastic float, brass seat, and EPDM seal.
Rated to 150 PSI (1035 kPa) and 240°F (115°C).

MODEL	NPT CONN		A	B	C	D	E	WRENCH SIZE	WEIGHT	
									lbs	kg
AAV-025	1/4”	in	0.25	3.62	1.56	0.50	2.62	7/8”	0.31	0.14
		mm	6.35	92	40	13	66	22		

DV - DRAIN VALVE

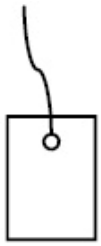


Drain valve with forged brass body, chrome plated ball, Teflon seats, double EPDM O-ring stem seals, aluminum handle, ¾” hose connection with cap and plastic retainer strap.
Rated to 600 PSI (4140 kPa) WOG and 250°F (120°C).

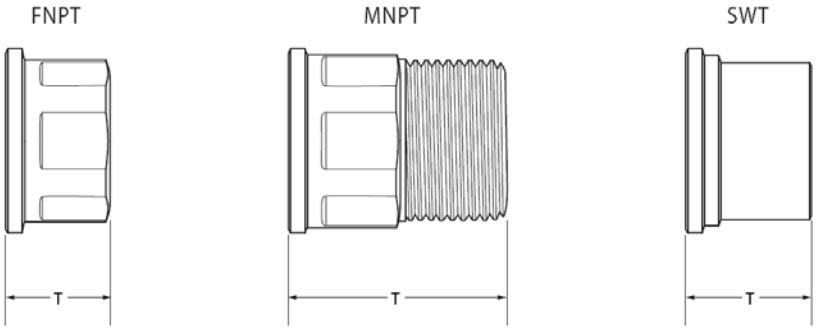
MODEL	NPT CONN		A	B	C	WEIGHT	
						lbs	kg
DV-025	1/4”	in	1.72	2.04	1.37	0.30	0.13
		mm	44	52	34		
DV-050	1/2”	in	2.45	2.77	1.46	0.44	0.20
		mm	61	70	37		

ACCESSORIES

INSULATION - INSULATION	
	Balancing Valve Insulation. STV/STVL Series Only

HT - HANGING TAG	
	Hanging Tag, plastic with chain for valve identification.

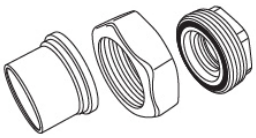
Tailpiece
Submittal Data



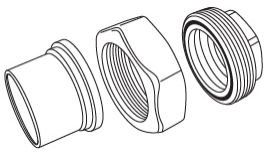
NOMINAL DIMENSIONS									
MODEL	FITS VALVE SIZE	CONN. SIZE		FNPT		MNPT		SWT	
				T		T		T	
		in	mm	in	mm	in	mm	in	mm
TP1-038(*)	1/2", 3/4"R, AB1e, BB1e, SV1e	3/8"	10	N/A	N/A	N/A	N/A	0.75	19.05
TP1-050(*)		1/2"	15	0.83	21.08	1.50	38.10	0.83	21.08
TP1-075(*)		3/4"	20	1.29	32.77	1.55	39.37	0.98	24.89
TP2-038(*)	3/4", 1"R, 1" AB2e, BB2e, SV2e	3/8"	10	N/A	N/A	N/A	N/A	0.75	19.05
TP2-050(*)		1/2"	15	0.83	21.08	1.50	38.10	0.87	22.10
TP2-075(*)		3/4"	20	0.83	21.08	1.56	39.62	0.98	24.89
TP2-100(*)		1"	25	1.40	35.56	1.75	44.45	1.00	23.37
TP3-050(*)	1"H, 1-1/4", 1-1/2", AB3, BB3, SV3	1/2"	15	N/A	N/A	2.13	54.10	N/A	N/A
TP3-075(*)		3/4"	20	0.79	20.07	1.80	45.72	1.28	32.51
TP3-100(*)		1"	25	0.98	24.89	1.80	45.72	1.41	35.81
TP3-125(*)		1-1/4"	32	1.00	25.40	1.80	45.72	1.43	36.32
TP3-150(*)		1-1/2"	40	1.75	44.45	1.80	45.72	1.17	29.72
TP4-100(*)	1-1/2"H, 2", AB4, BB4, SV4	1"	25	N/A	N/A	2.51	63.75	1.98	50.29
TP4-125(*)		1-1/4"	32	N/A	N/A	1.98	50.29	1.49	37.85
TP4-150(*)		1-1/2"	40	1.98	50.29	1.98	50.29	1.59	40.39
TP4-200(*)		2"	50	1.80	45.72	1.98	50.29	1.50	38.10

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

UA-1 - Union Adapter	
	Union Adapter UA-1

UA-1-Kit - Union Adapter Kit	
	Union Adapter UA-1-Kit

UA-2 - Union Adapter	
	Union Adapter UA-2

UA-2-Kit - Union Adapter Kit	
	Union Adapter UA-2-Kit

ACCESSORIES

Flexible Hose Connectors

Submittal Data

These hoses have been specially designed for operating conditions in heating and air conditioning, the elastomer is not sensitive to Glycol or water treatment products.

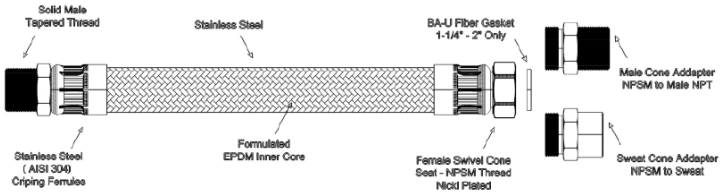
Each hose is made up of several quality components and the special crimping on the ferrule under strict quality control gives this hose security against any leakage.

The special EPDM core meets a fully defined specification: Shore hardness, resistance to ageing, mechanical resistance (elasticity, tensile fracture, stretching), ability to accept chemical agents in contact with the elastomer and non-toxic. ASTM Fire rated hoses meet 25/50 flammability and smoke development classification requirements of codes and specifications when tested by ASTM E 84 method.

HOSES ARE DESIGNED FOR HYDRONIC HEATING/COOLING, NOT FOR GAS.

SPECIFICATIONS

Temperature Ratings:	All Sizes: 5ºF to 230ºF Less than 41ºF with use of Glycol additive
External Braiding:	304 Stainless Steel
Crimping Ferrules:	304 Stainless Steel
Core:	EPDM
End Connections:	Brass - CW614N ▪ 1/2" - 1" MNPT x Male Cone x Hose Adaptor (Gasket Less Connection) ▪ 1-1/4" - 2" MNPT x BA-U Gasket & Hose Adaptor
Adaptor Connections:	Male NPT, Copper SWT
Union Nut:	Nickel Plated Brass - CW614N
Tailpiece:	Brass - CW614N
Gasket (1-1/4" & 2"):	BA-U Fiber



Specs for Application and Installation

• ON INSTALLATION : Avoid absolutely any tension due to stretching, twisting or torsion during the course of tightening the connectors.

A. Install and tighten the fixed male connector (if applicable)

B. Install and tighten the union adaptor (if applicable)

C. Install and tighten the swivel nut

• Use two spanners in order to screw in the union: One to hold the hexagon of the adaptor. The other to tighten the nut at the same time.

IMPORTANT - Do not re-screw the fixed connector or adaptor after tightening of the swivel nut; this will cause torsion on the flexible hose, with a risk of rapid deterioration. On removal, take the same precautions. If the flexible incorporates two fixed connectors, at least one must be installed on a counter-part fitted with a screw connector.

***BEFORE INSTALLING REFER TO THE INSTALLATION & OPERATION INSTRUCTIONS FOR COMPLETE DETAILS. WARNING: FAILURE TO FOLLOW THE INSTALLATION & OPERATION INSTRUCTIONS COULD RESULT IN IMPROPER INSTALLATION.**

NOMINAL DIMENSIONS

SIZE	MODEL #					
	HCA	HCB	HCC	HCD	HCE	HCF
12" LENGTH	1/2"	3/4"	1"	N/A	N/A	N/A
18" LENGTH	1/2"	3/4"	1"	1-1/4"	1-1/2"	N/A
24" LENGTH	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
36" LENGTH	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"

Cv *

SIZE	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
12" LENGTH	3.3	11.0	20.9	N/A	N/A	N/A
18" LENGTH	3.2	10.7	20.3	37.9	64.4	N/A
24" LENGTH	3.1	9.9	19.5	36.9	61.0	110.7
36" LENGTH	3.0	9.3	18.2	34.7	55.0	100.8

* Note the Cv factor is the flow rate, in GPM, through the hose at 1 PSID.

Max. Operating & Burst Pressure Rating

Size	Operating (PSI)	Burst (PSI)
1/2"	375	1500
3/1"	300	1200
1"	225	900
1-1/4"	200	800
1-1/2"	175	600
2"	150	500

Typical Specifications:

Furnish and install where indicated on plans **Flexible Connectors** as provided by **Macon Balancing**. Hoses shall be temperature rated: 5ºF to 230ºF. Pressure rated from 375 PSI to 150 PSI based on hose diameter. Constructed specifically for operating conditions in heating and air conditioning with solid brass connectors, stainless steel ferrules, AISI 304 stainless steel braid, and formulated EPDM inner core design to not be sensitive to Glycol or water treatment products. Hoses shall meet 25/50 flammability and smoke development classification requirements of codes and specifications when tested by ASTM E 84 method.

JOB: _____ ENGINEER: _____

REP: _____ CONTRACTOR: _____

ACCESSORIES

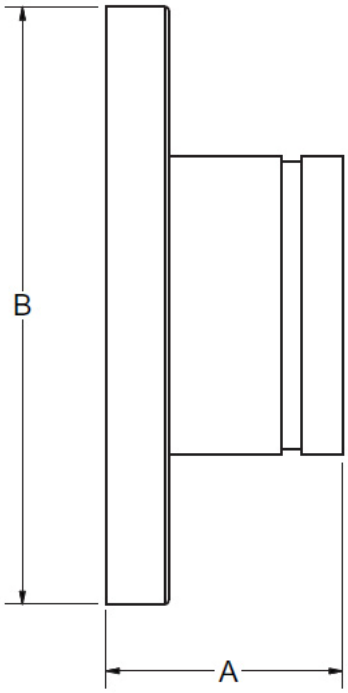
Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

Tunstall Corporation
118 Exchange Street · Chicopee, MA 01013
Phone (413) 594-8695 · Fax (413) 598-8109

Model GF is a fabricated Groove x Flanges adaptor. 150# Plate Flange with schedule 40 groove steel pipe section.

SPECIFICATIONS

Pressure Ratings:	200 psig (1380 kPa)
Temperature Ratings:	250ºF (120ºC)
Flange:	Steel
Pipe Section:	Steel, Schedule 40
End Connection:	150# Plate Flange X Schedule 40 steel pipe



NOMINAL DIMENSIONS & WEIGHTS

MODEL	FLANGE PIPE SIZE	A		B		WEIGHT	
		in	mm	in	mm	lbs	kg
GF-250	2.50”	3.00”	76.2	7.00	177.8	8.3	3.76
GF-300	3.00”	3.00”	76.2	7.50	190.5	10.0	4.54
GF-400	4.00”	3.00”	76.2	9.00	228.6	13.8	6.26
GF-500	5.00”	4.00”	101.6	10.00	254.0	17.1	1.76
GF-600	6.00”	4.00”	101.6	11.00	279.4	21.1	9.57
GF-800	8.00”	6.00”	152.4	13.50	342.9	40.1	18.19
GF-1000	10.00”	6.00”	152.4	16.00	406.4	54.8	24.86
GF-1200	12.00”	6.00”	152.4	21.00	533.4	85.3	38.69

ACCESSORIES

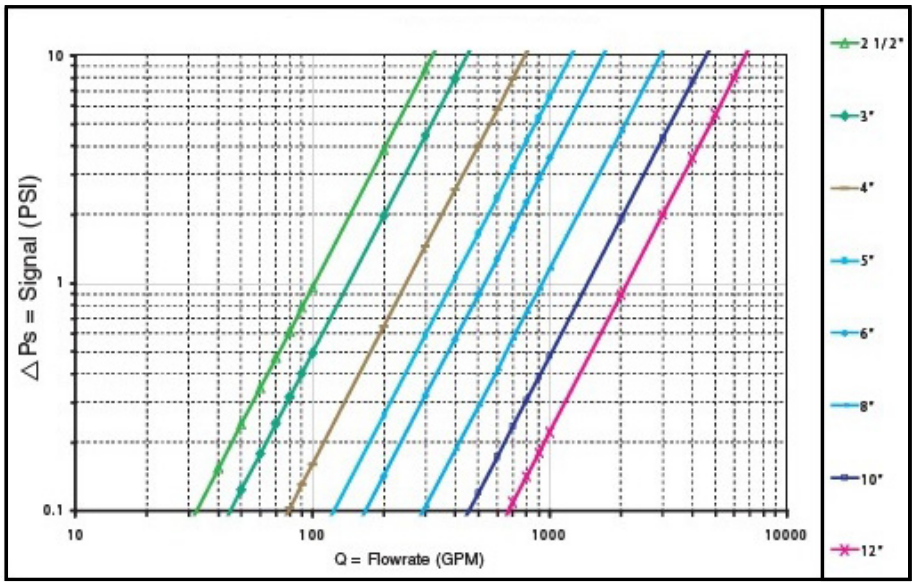
Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

FEATURES

- Stainless steel wafer metering station
- For ANSI 125 or ANSI 150 flanges
- Designed according to BS7350
- Tolerance on nominal K_{vs} ±5%
- Gost compliant
- Class 125

SPECIFICATIONS

Temperature Ratings:	-15ºF to 265ºF Below 32ºF only for water with added anti-freezing fluids Over 212ºF only for water with added anti-boiling fluids
Body:	Stainless Steel, AISI 316
Extension:	Stainless Steel, AISI 3161
Test point:	DZR Brass, ASTM C35330



Size	Cvs	Cv
2-1/2”	102.0	175.4
3”	142.2	261.6
4”	249.3	426.3
5”	389.5	654.2
6”	530.2	901.4
8”	929.4	1635.9
10”	1444.0	2497.2
12”	2122.6	3693.7

ACCESSORIES

Model PFM-2000

Pressure Flow Meter
Submittal Data

A precision instrument for the measuring and documentation of water flow in heating, cooling and drinking water systems.

PFM-2000 is a meter for pressure and flow measurements across, for example, balancing valves. Valve characteristics for a number of valves from different manufacturers are stored in the PFM-2000's memory. The valve database is updated continuously. Every instrument unit is delivered with a CD-ROM containing demo programs, valve data and manuals.

SPECIFICATIONS

Measuring Range

Pressure Difference:	up to 150 kPa, at total pressure <1000 kPa Max 2000 kPa
Static Pressure:	up to 1000 kPa

Accuracy

Pressure Difference:	<10 kPa ± 0.1 kPa >10 kPa ± 1% of metered value
Flow:	As for pressure + the valve's deviation

Resolution

Pressure Difference:	0.01 kPa, at total pressure <100 kPa 0.1 kPa, at total pressure >100 kPa
Static Pressure:	10 kPa
Flow:	0.001 I/s

Environment

Temperature media:	-10º C to 100º C
Temperature Storage:	-20º C to 60º C
Humidity, not controlled:	Max 90% RH

Power Supply

Capacity:	1500mAh

R6 Rechargable NiMH batteries (6)

Included in Delivery

Meter x 1
Sensor x 1
Cable x 1
Hoses & Connectors x 2
Battery Charger x 1
Durable Case x 1
Allen Key, 3mm x 1
Allen Key, 5 mm x 1
Manual x 1
Program Disc x 1
Calibration Protocol x 1

ACCESSORIES

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

Model TT841 Test Kit

Submittal Data

SPECIFICATIONS

Maximum Pressure Ratings:	500 PSIG (34.7 bar)
Maximum Temperature Ratings:	150ºF (66ºC)
Gauge:	Aluminum Body, Stainless Steel internals Buna-N-Seals, 2-1/2" Dial Dial ranges - 0 to 50" H_2O through 0-100 PSID.
Tubing & Fittings:	Brass
Hoses:	Nitrile Jacket and "Schrader" 1/4" Brass Coupler. Connects with 1/4" 37º Flare Male Fittings.
Filters:	90 Micron Brass (For Replacement Filter Elements, Order Kit No. 98008).

CAUTION: Severe damage may occur if this test kit is subject to freezing themperaure. Drain the kit after use.

For additional information about this test kit or other Macon Balancing products, please contact your local Macon representative or the factory direct.

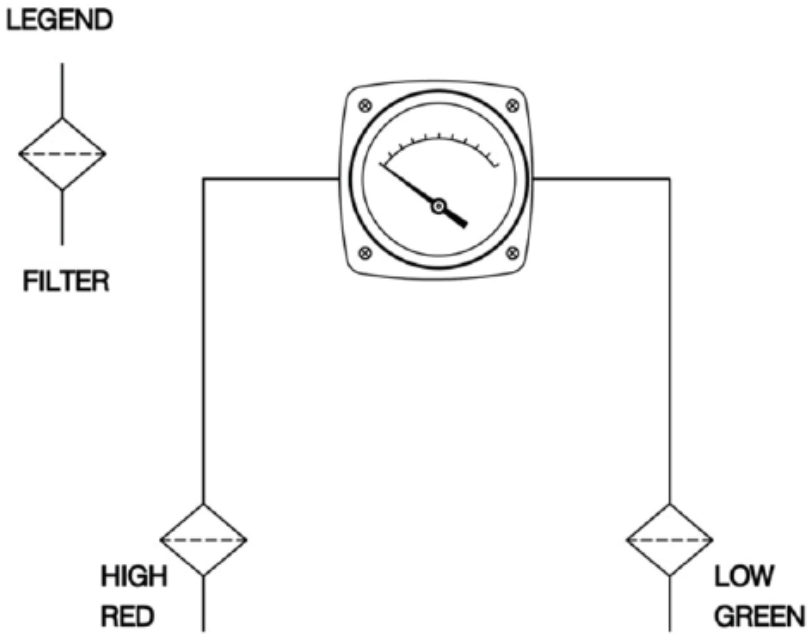
This test kit is equipped with a rugged differential pressure gauge with an accuracy of ±3-2-3% full scale (ascending) ideally suited for measuring the pressure drop across various types of equipment (i.e. filters, pumps, balancing valves, etc.).

ACCESSORIES

MODEL TT841 TEST KIT
BASIC OPERATING INSTRUCTIONS

1. Connect hoses to test connections:
   - ⇒ red high pressure hose upstream
   - ⇒ green low pressure hose downstream.
2. Open valves on device being tested and read differential (or flow).
3. Upon completion of test close valves, disconnect hoses and store them in test kit case.

NOTE: The 841 Test Kit is equipped with in line filters near the ends of the hoses. If the gauges respond slowly to changes in the differential pressure, the filter elements may be partially plugged. To remedy this, unscrew the two halves of the filter housing and remove brass filter element. It may be cleaned by flushing with mild detergent and water. If, after reassembly, this has not satisfactorily improved the response time a replacement filter element kit #98008 should be installed.

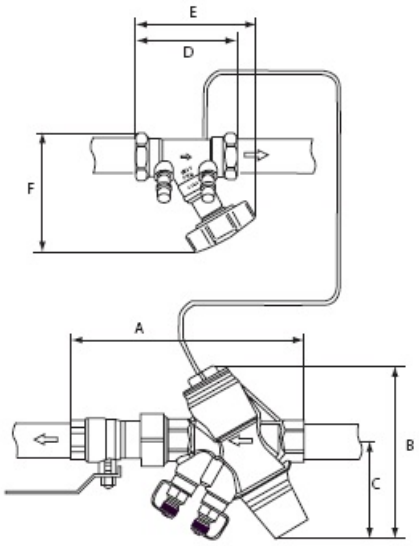


NOTE: This test kit is plumbed for water service. Contact the factory before using on other liquids or gases.

ACCESSORIES

AREAS OF USE
Macon Balancing PVM is used to distribute the flow within different areas in heating and cooling systems.

DESCRIPTION
PVM is a dynamic valve unit developed to regulate pressure drop. A fully open STV mounted on the intake, and a PV differential pressure valve on the return. The pressure-compensating mains control valve ensures problem-free setting of the various mains. The PVM valve is equipped with a signaling circuit, cut-off valve, drain valve and measurement socket as standard.
The PVM valve guarantees 100% differential pressure regulation under all conditions, regardless of whether changes are made in the system.
The valve regulates the system and removes noise problems due to high pressure drop. After setting the valve no further adjustment to the valves is necessary.



SPECIFICATIONS

Pressure Ratings:	58 psi
Temperature Ratings:	14ºF to 248ºF
Body:	Brass CW617N
End Connections:	Female, NPT
Gaskets:	EPDM
Handwheel:	Polyamide Plastic
Pressure class	PN16

NOMINAL DIMENSIONS & WEIGHTS													Valve Selection Guide		
SIZE			A	B	C	D	E	F	WEIGHT		Handwheel Turns	Preset Turns	GPM		Min. psi
in	mm								lbs	kg			Min.	Max.	
1/2"	15	in	6.57	5.83	3.78	3.39	4.37	3.74	5.81	2.64	10	5	0.22	2.65	0.73-4.35 psi
		mm	166.88	148.08	96.01	86.11	111.00	95.00							
3/4"	20	in	6.81	5.94	3.86	3.54	4.49	3.74	4.40	1.99	10	5	0.44	4.44	
		mm	172.97	150.88	98.04	89.92	114.05	95.00							
1"	25	in	7.95	6.10	4.02	4.02	4.72	3.78	5.88	2.67	10	8	2.65	11.00	
		mm	201.93	154.94	102.11	102.11	119.89	96.01							
1-1/4"	32	in	9.25	7.40	4.52	4.72	5.00	3.78	10.02	4.54	10	2	3.08	18.50	2.9-11.6 psi
		mm	234.95	187.96	114.81	119.89	127.00	96.01							
1-1/2"	40	in	10.12	8.11	4.69	5.20	5.47	4.25	13.35	6.05	10	2	4.40	22.00	
		mm	257.05	205.99	119.13	132.08	138.94	107.95							
2"	50	in	11.26	6.22	4.96	6.06	5.83	4.37	18.99	8.61	10	2	22.00	66.00	
		mm	286.00	157.99	125.98	153.92	148.08	111.00							

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

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SETTING THE VALVE
The valve is easy to set on the knob using a 4 mm Allen key. The setting is read off the pressure drop diagram for each dimension. When presetting the valve, start by screwing the setting to minimum. Then open the valve to the required value according to the diagram. The STV valve is used solely for shutting off and flow measurement, it must not be set in any position other than open.

Presetting

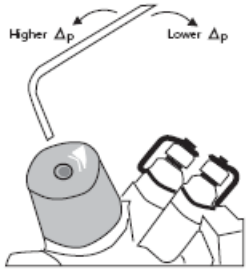
The PVM valve is preset according to the diagram.
The curves (the oblique lines that indicate the pressure in the main line) are shown in intervals of 0.73 psi to make it simple to take a reading. The curves can be moved so that the valve setting can be produced if, for example, 1.74 psi is selected in a pipe instead.

Example: We decide to maintain 1.74 psi differential pressure in the main at a flow of 2.2 gpm
(2.2 gpm comes from the presetting on the radiators).

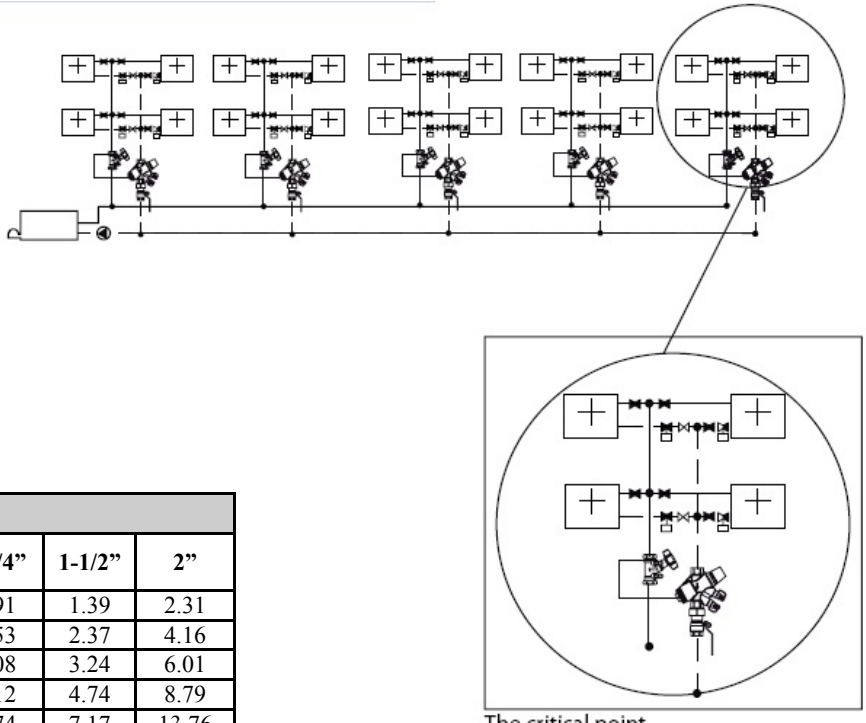
From the point where 1.74 psi cuts the horizontal line flow 2.2 gpm) a vertical line is taken down to the x-axis. It is then easy to read off that the valve should be set at approx. 7 turns. The minimum pressure drop will then be 0.28 psi over the valve.

Total pressure drop:
To dimension the pump it will be:
△Ps + △Pv = △P
1.74 +0.28 = 2.02 psi
Also include the pipe pressure drop from the valve to the pump.

The pump can subsequently be adjusted optimally by measuring the differential pressure from PF to P- (P pump). To verify the secondary pressure drop calculated, it can be checked by measuring PF to P+ and the result should then be 1.74 psi.



INSTALLATION EXAMPLE
Overview of a heating system with 5 staircases with 4 apartments on each one.
The critical valve, defined as the valve with the lowest pressure drop as a rule of thumb this will be the valve positioned furthest away from the pump, is used to lower the pump pressure so that the valve achieves the correct pressure. The lowest possible pressure is then obtained in the system.
See dimensioning pump pressure.



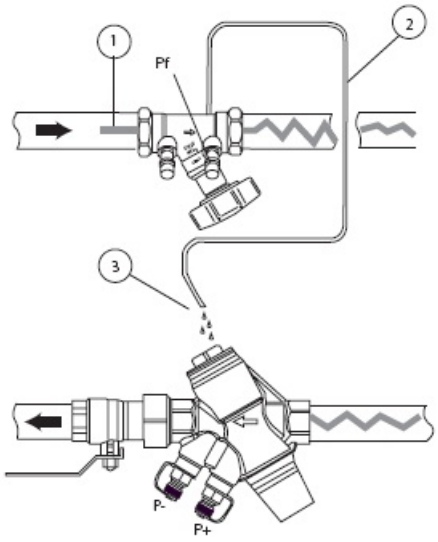
The critical point

cv-value of the STV Valve						
Number of Turns	**1/2”**	**3/4”**	**1”**	**1-1/4”**	**1-1/2”**	**2”**
1	0.21	0.39	0.55	0.91	1.39	2.31
2	0.37	0.69	0.89	1.53	2.37	4.16
3	0.52	0.96	1.19	2.08	3.24	6.01
4	0.72	1.31	1.73	3.12	4.74	8.79
5	0.99	1.79	2.66	4.74	7.17	13.76
6	1.35	2.43	4.16	6.82	10.29	19.31
7	1.87	3.35	5.78	9.02	13.87	24.51
8	2.95	4.45	7.51	11.21	16.99	28.90
9	3.64	5.20	9.13	13.30	19.77	33.06
10	4.10	5.90	10.17	15.14	22.54	36.42

STANDARD APPLICATION

PVM is fitted in the intake, the signal pipe is to be connected at the low pressure side of the STV valve, The valve can be fitted irrespective of whether it is a straight length of pipe. Bends, tubes etc. can be installed immediately after the valve.

1. Flush the valve before fitting signal pipe
2. Install t-pipe with measurement socket on the STV valve.
3. Install signal pipe, on the t-pipe and flush to ensure that there is no air in the signal pipe.
4. Install the signal pipe on the PVM valve on the return pipe.



DIMENSIONING

Selecting the right valve in an installation requires some data about the system.

△P pump	available differential pressure from pump
△P load	differential pressure for circulation
△P STVP	pressure drop over valve fully open (diagram)
△P PVM	pressure drop over the PVM valve (diagram)

Example:
Calculated value for a valve is 6.34 gpm.
7.25 psi is available differential pressure for circulation △P load 2.9 psi is required for the main.

We find the minimum differential pressure required for the PVM valve to achieve minimum working pressure in the diagram.
Two valves can deliver 6.34 gpm 1” and 1 1/4”.

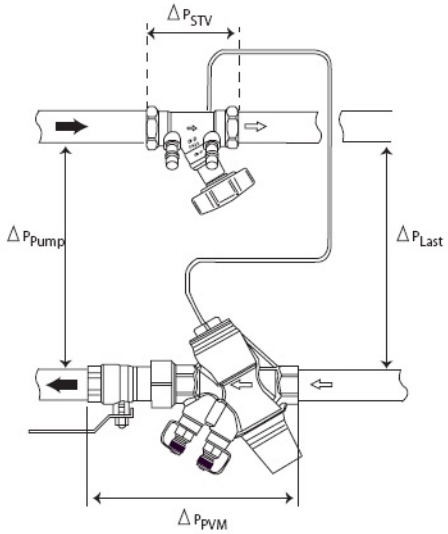
ADJUSTMENT AND MEASURING

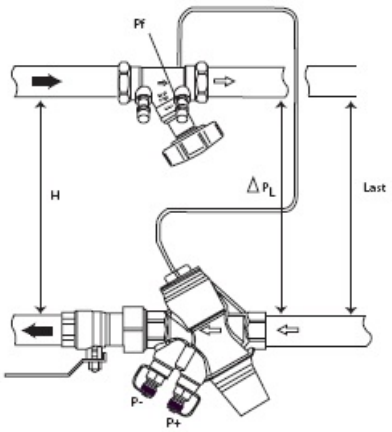
When adjusting the differential pressure on the PVM valve, measure and adjust to 10 kPa, making sure at least one radiator valve is slightly open.

When measuring the flow, use the STV valve and a measuring tool. The STV valve’s wheel may be set lower to have a higher differential pressure over the PVM valve. Note that the differential pressure over the STV valve will not be too high so that the min differential pressure over the PVM valve will be to low and the PVM valve will stop regulating. Open the STV valve completely after measuring the flow.

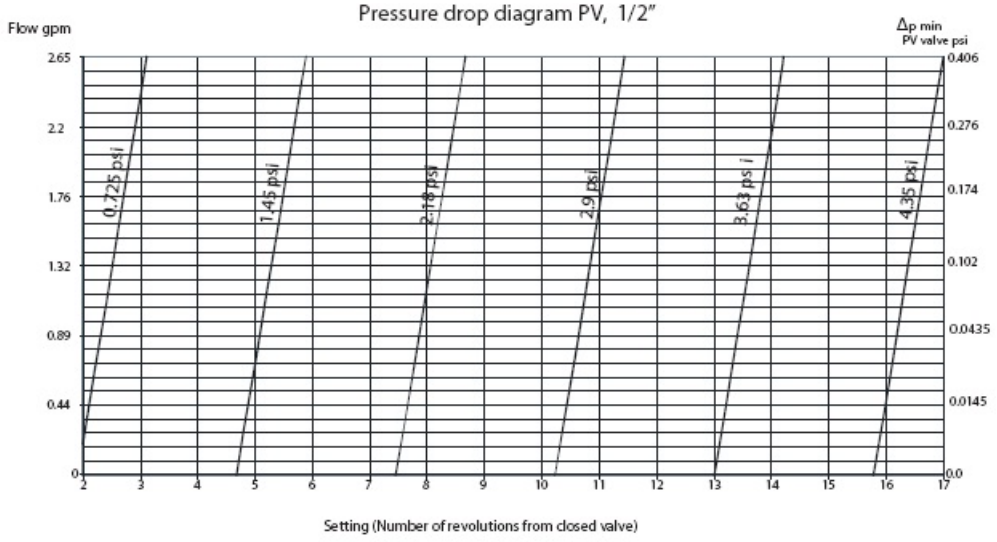
OPTIMIZING PUMP PRESSURE

Lowering to minimum possible pump differential pressure is carried out by measuring at the PVM valve and obtaining at least 1.91 psi, this is the pump’s lowest level at which the PVM can be regulated.

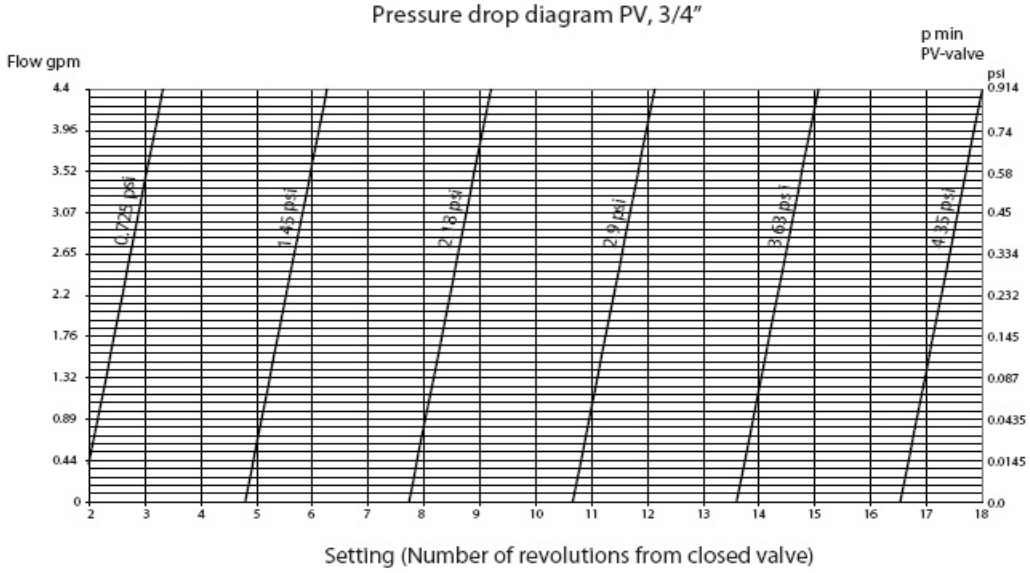




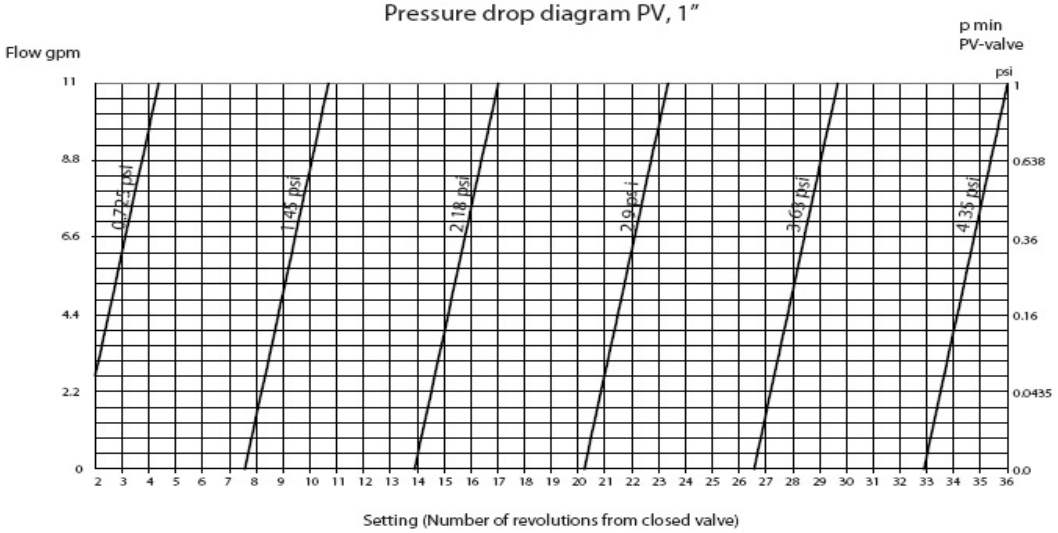
Pressure drop diagram PV, 1/2"



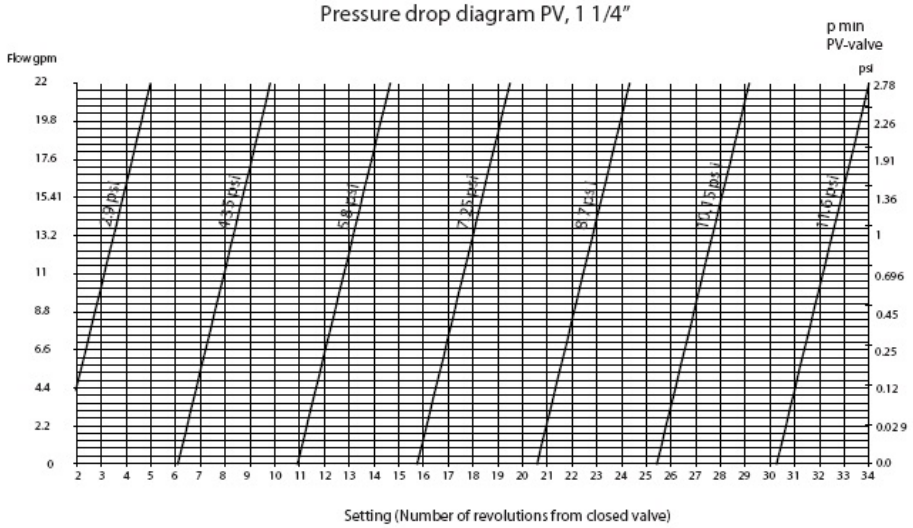
Pressure drop diagram PV, 3/4"



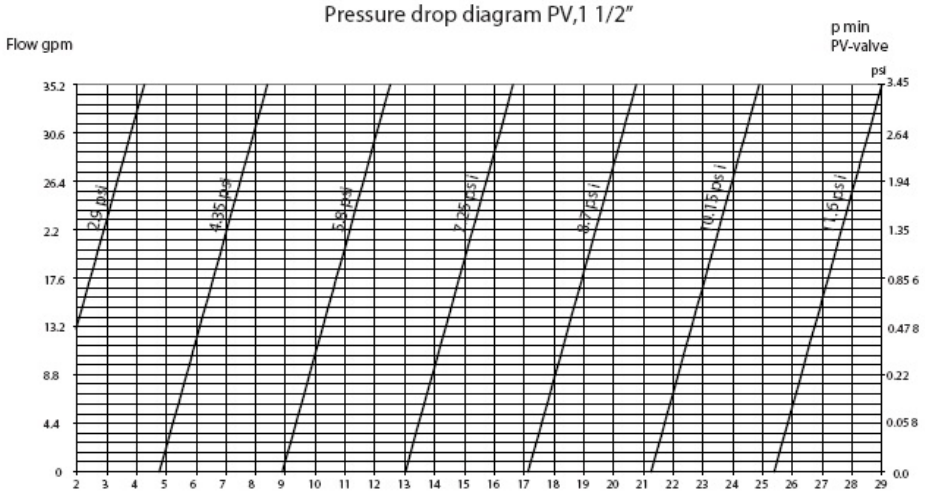
Pressure drop diagram PV, 1"



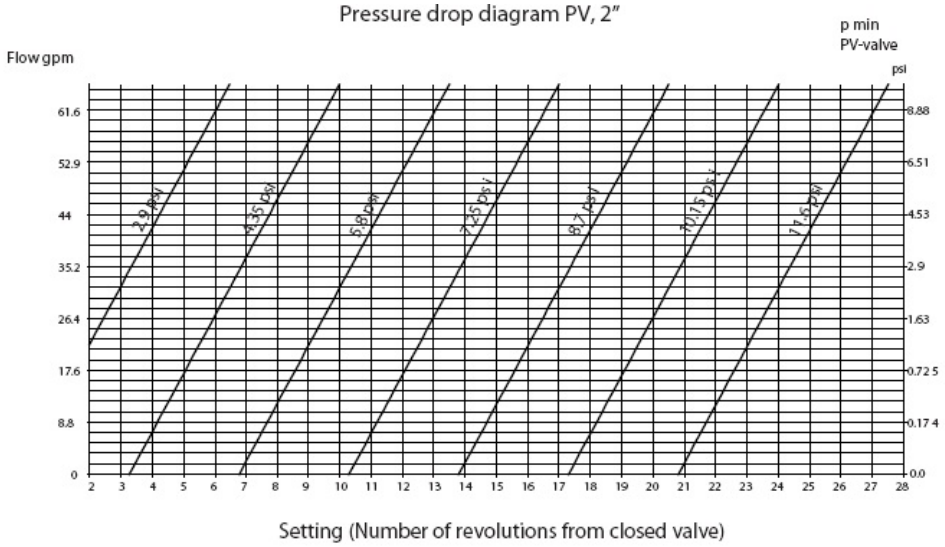
Pressure drop diagram PV, 1 1/4"



Pressure drop diagram PV,1 1/2"



Pressure drop diagram PV, 2"



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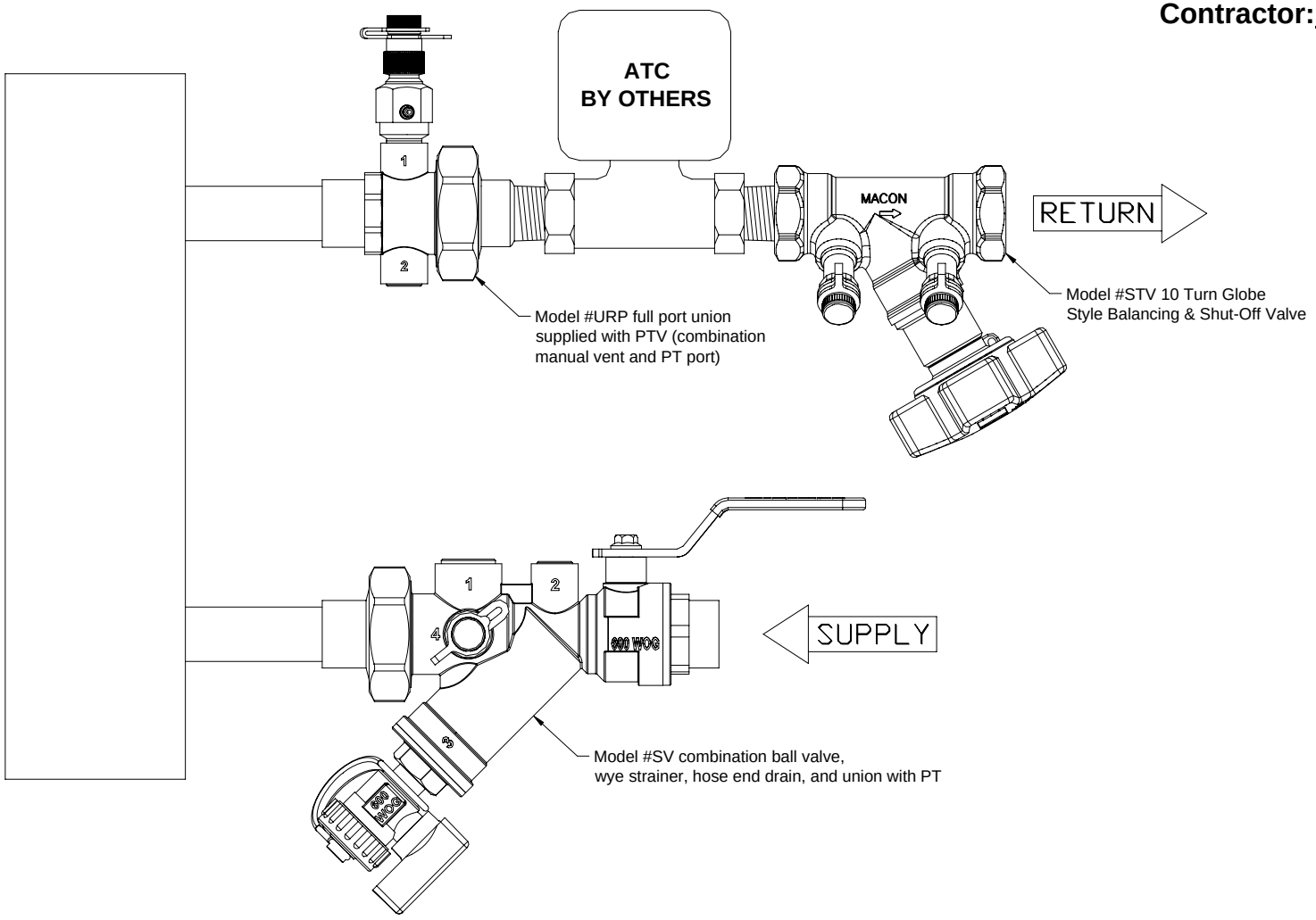
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
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Phone: 413-594-8695
Fax: 413-598-8109

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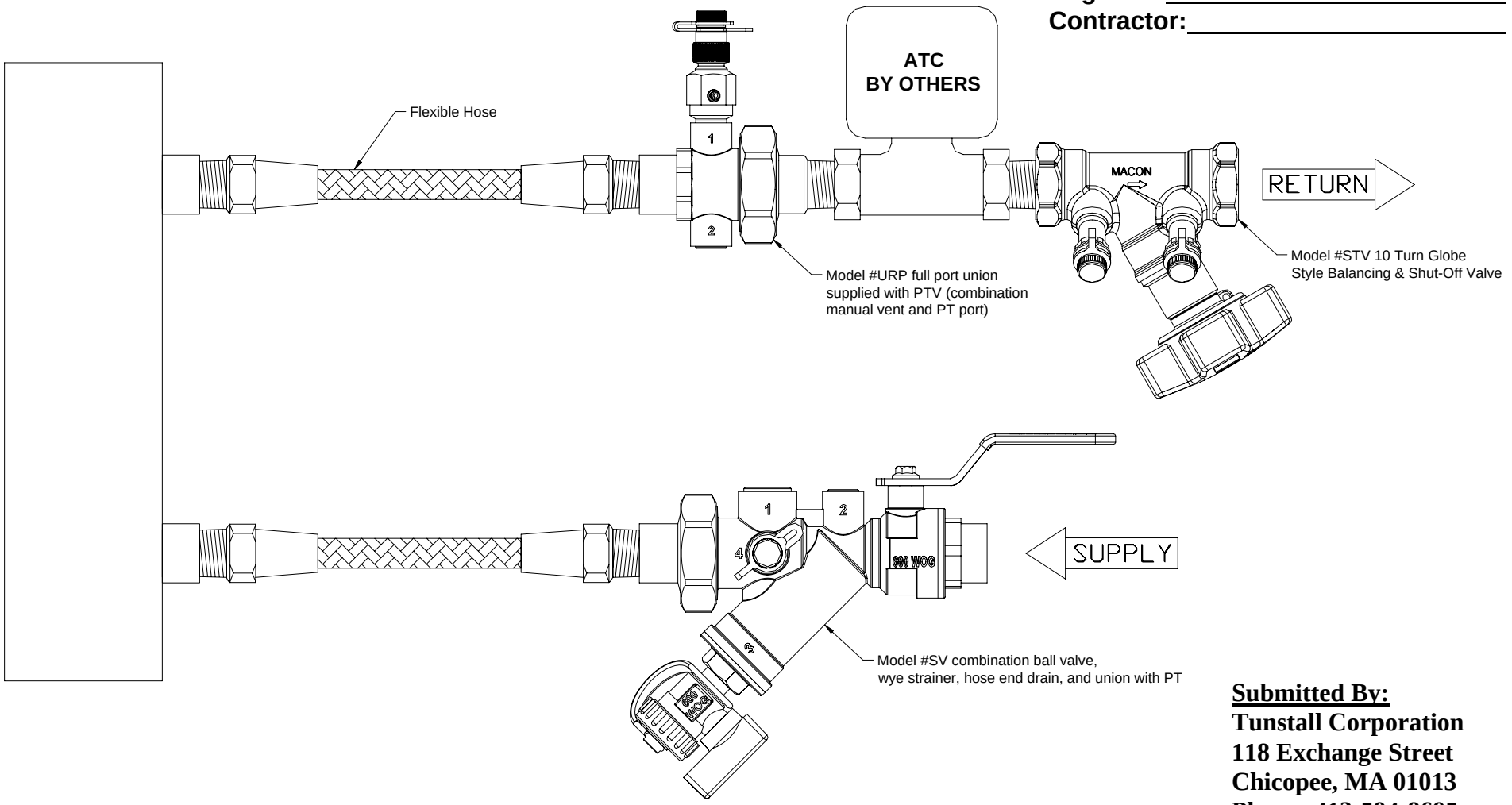
Engineer:_____
Contractor:_____



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Phone: 413-594-8695
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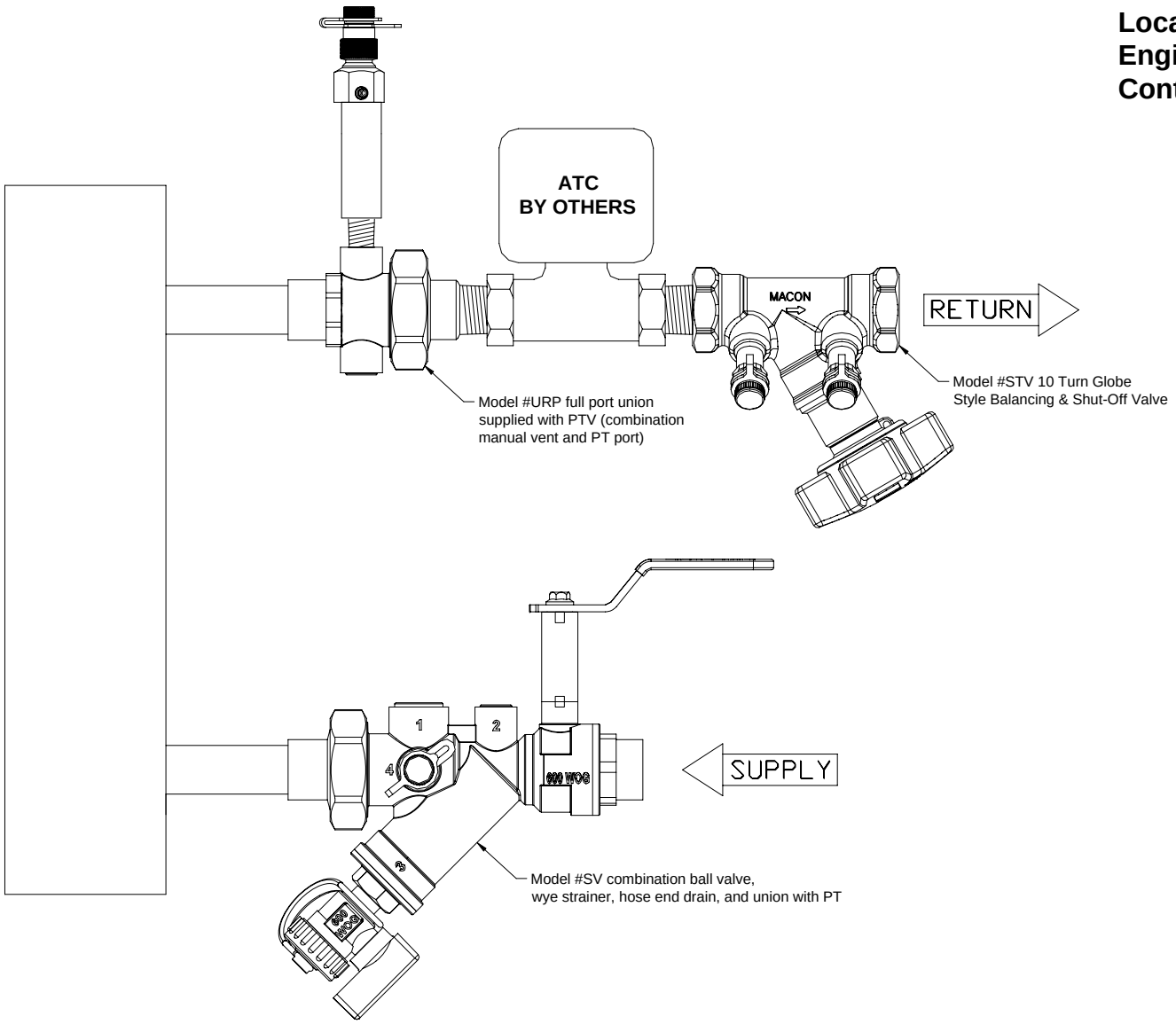
Location:_____
Engineer:_____
Contractor:_____



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118 Exchange Street
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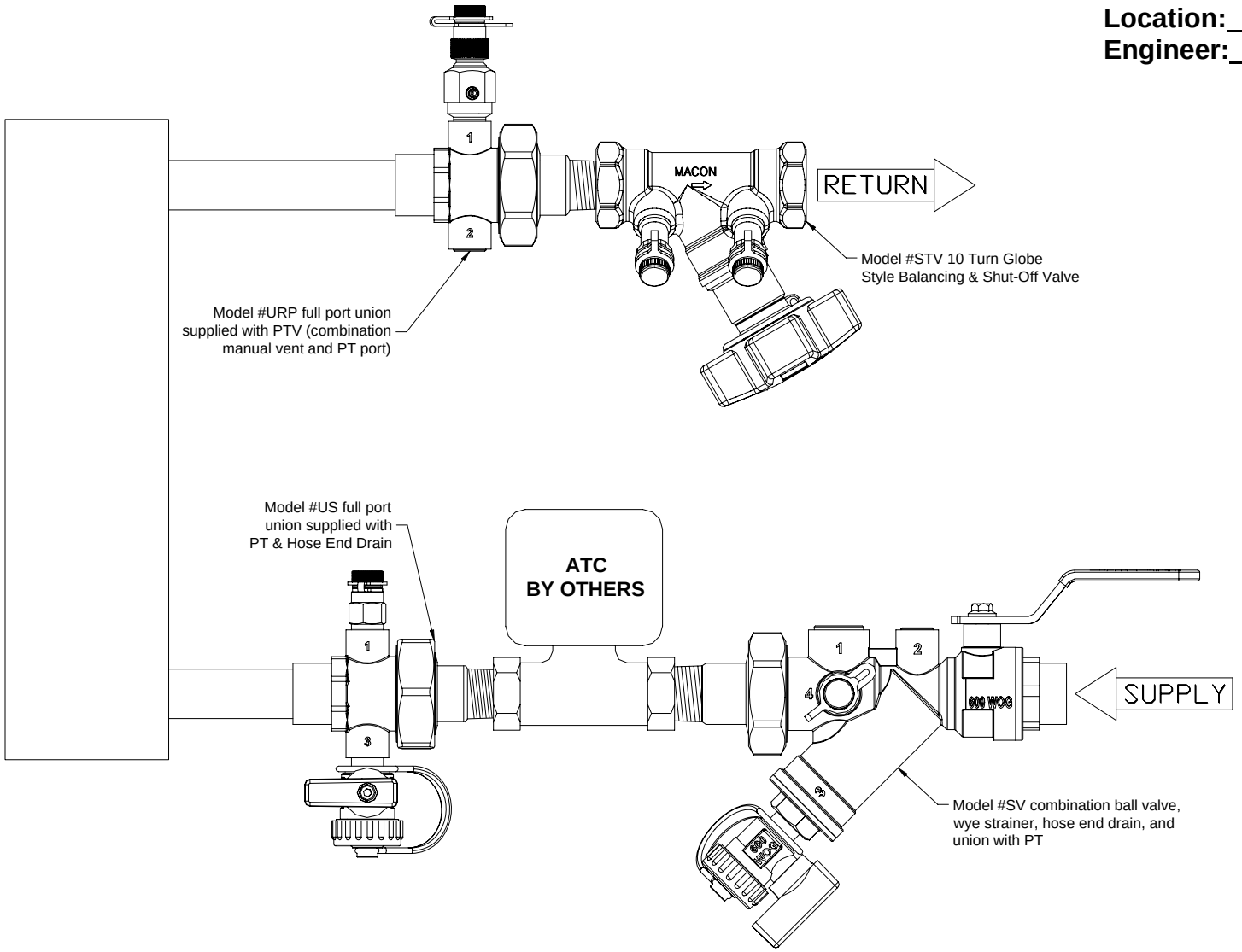
Location:_____
Engineer:___



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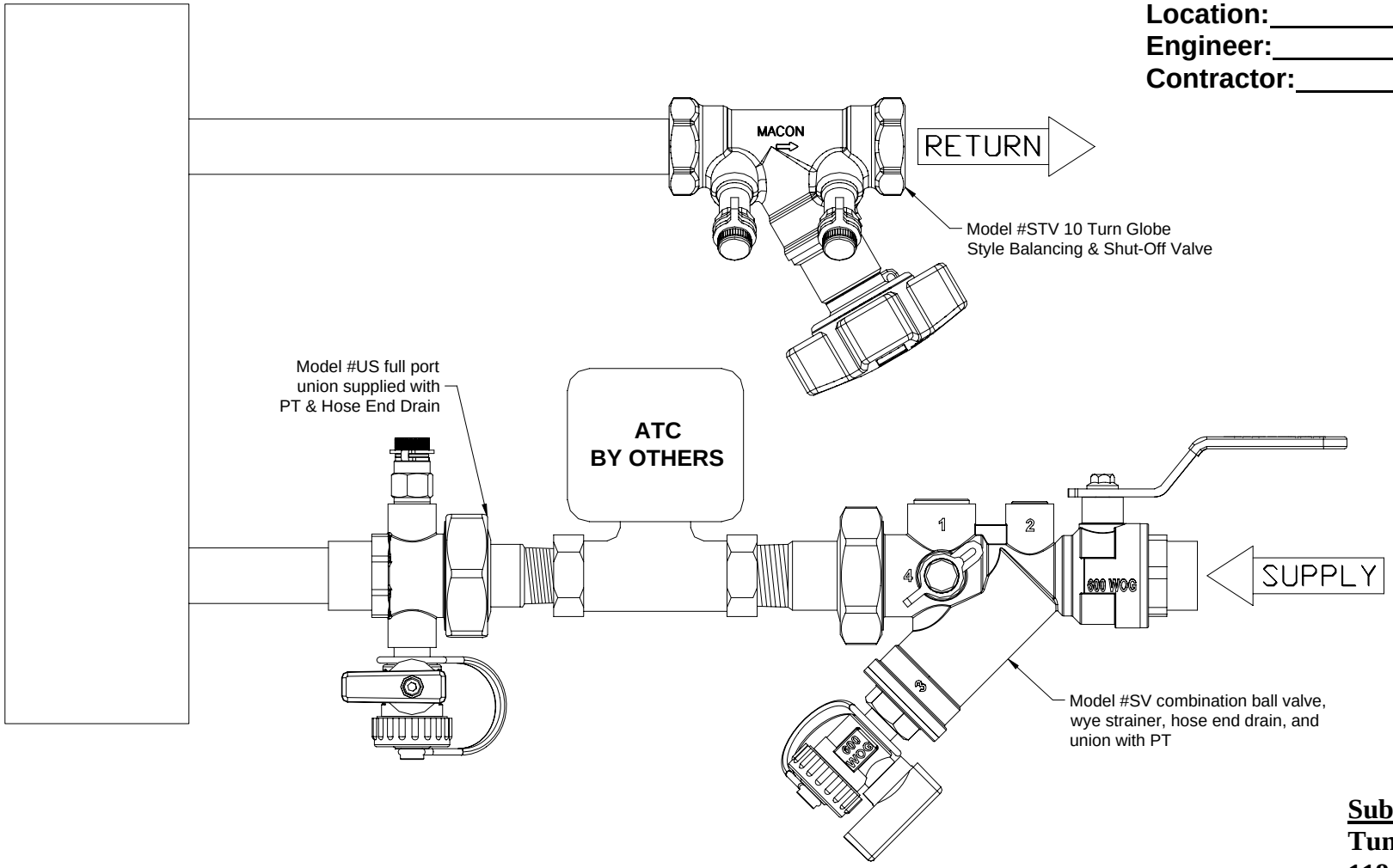
Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Valve Package (Model # 2SSX-CS-FLEX)

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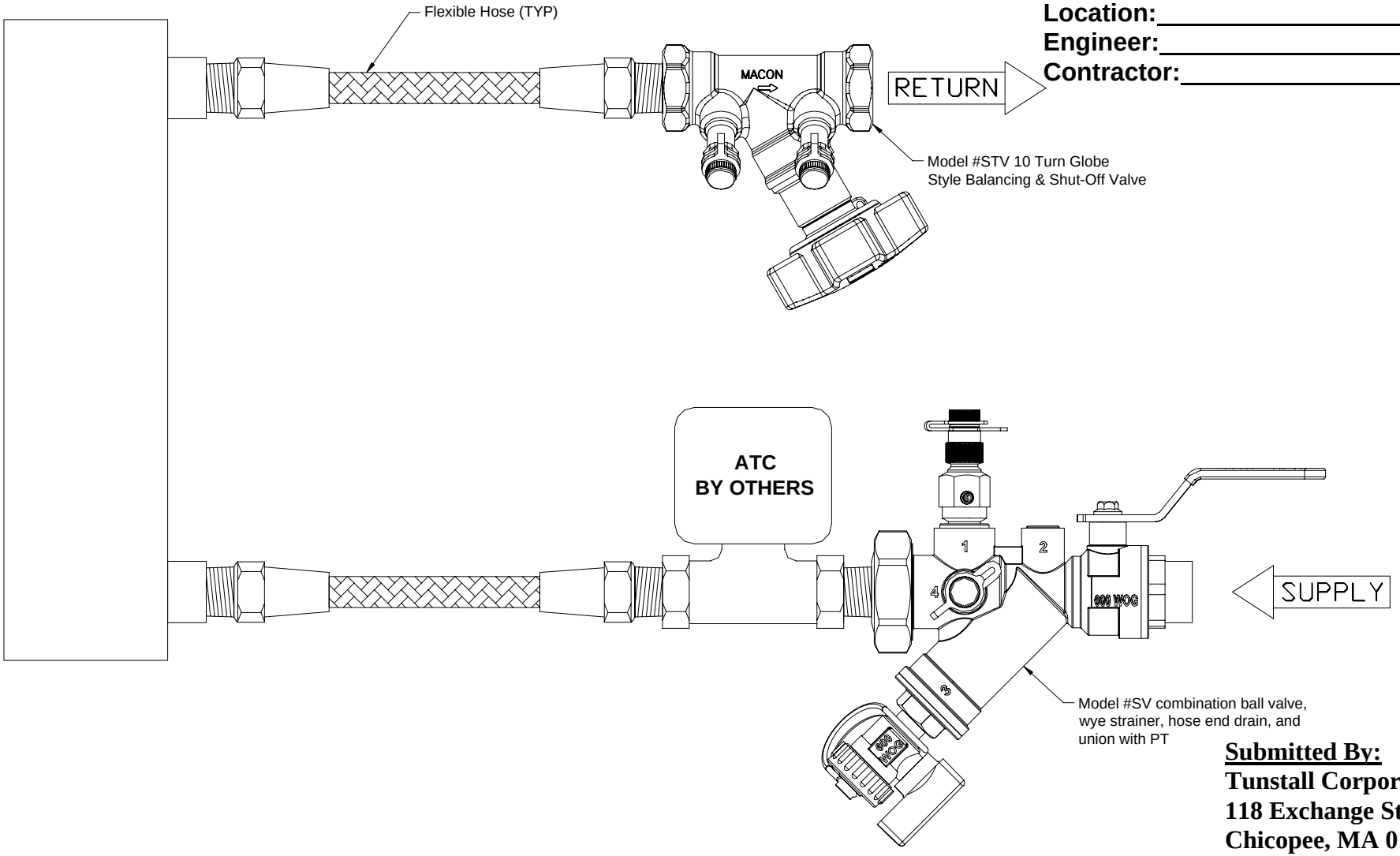
Engineer:_____
Contractor:_____



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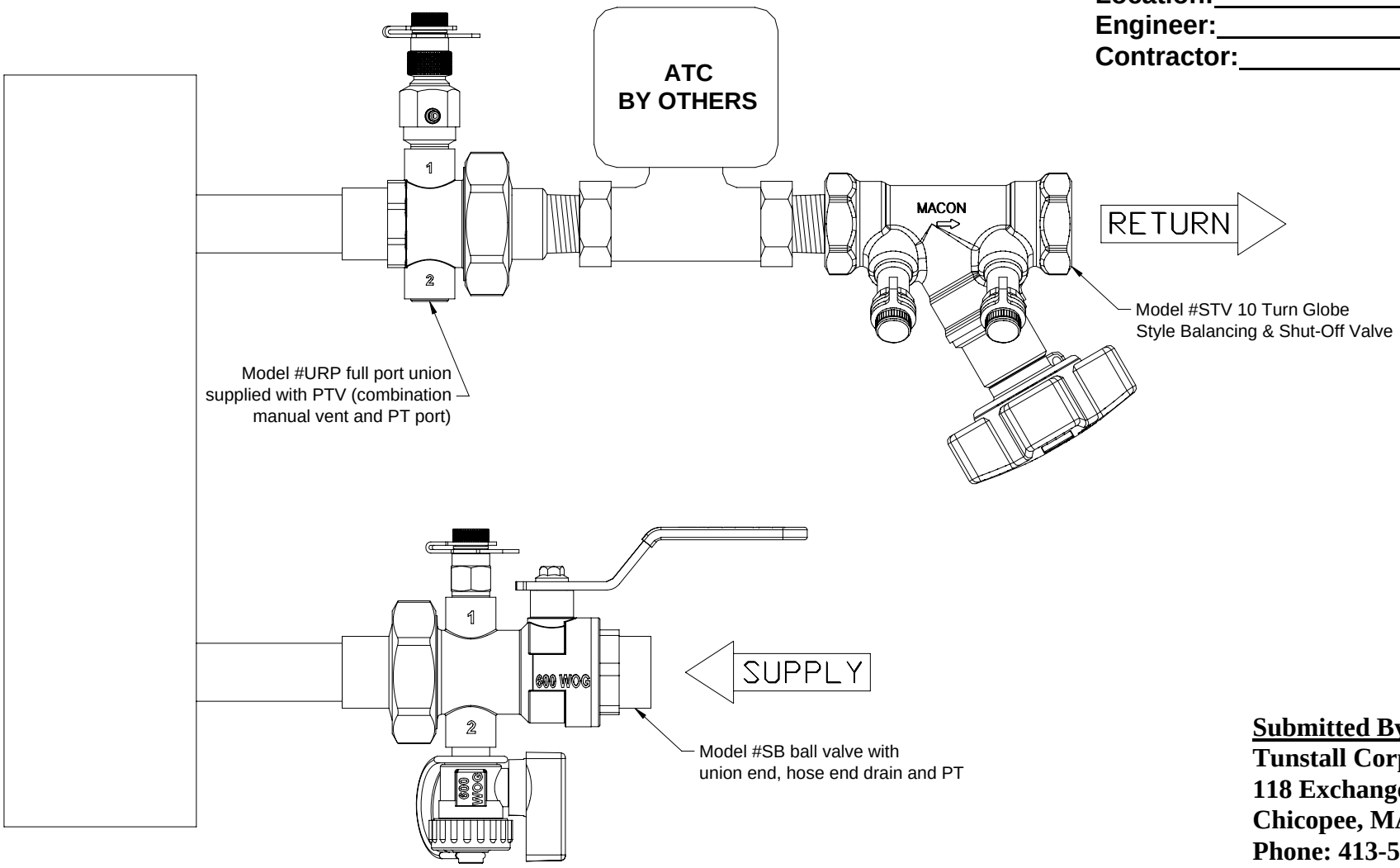
Valve Package (Model # 2RB-CS)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Valve Package (Model # 2RB-CS-FLEX)

Job Name:_____
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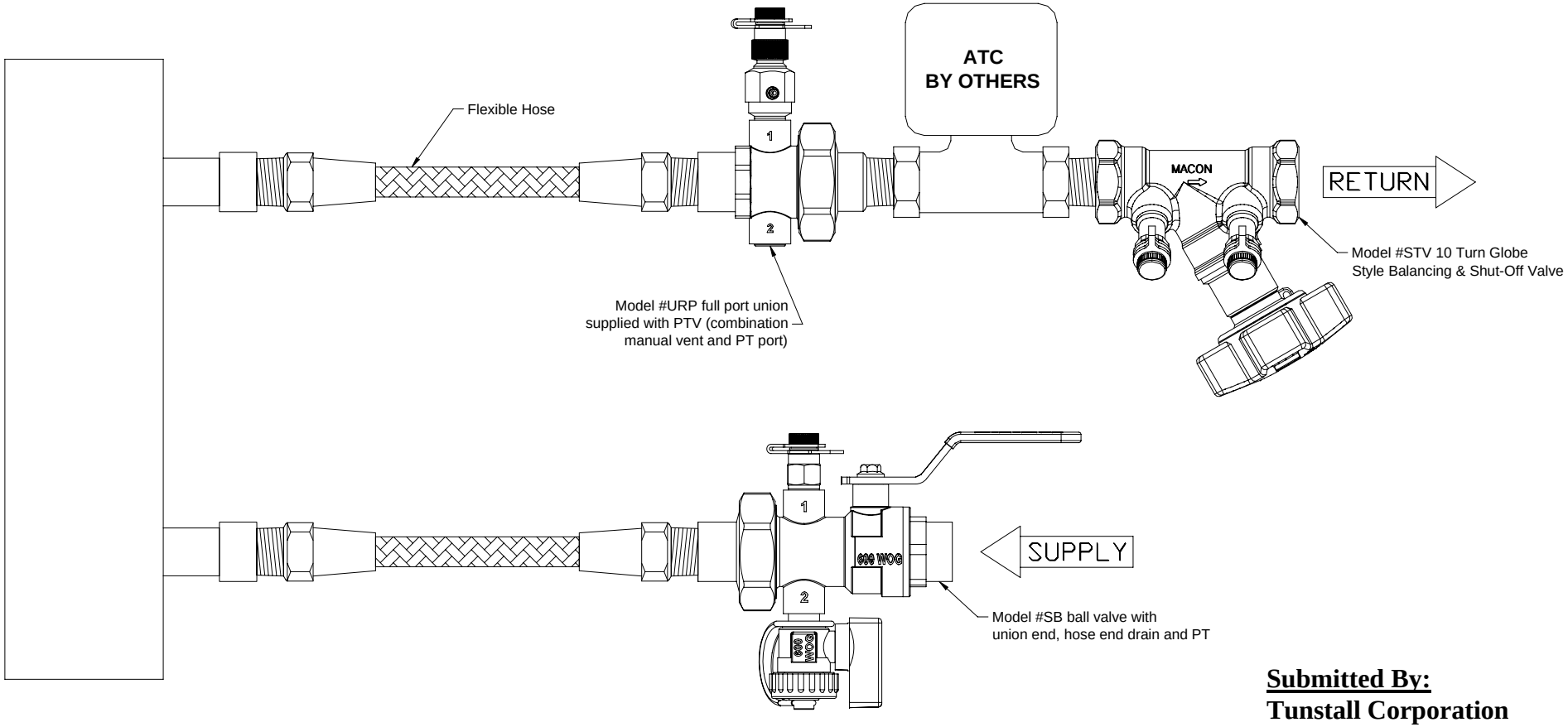
Engineer:_____
Contractor:_____



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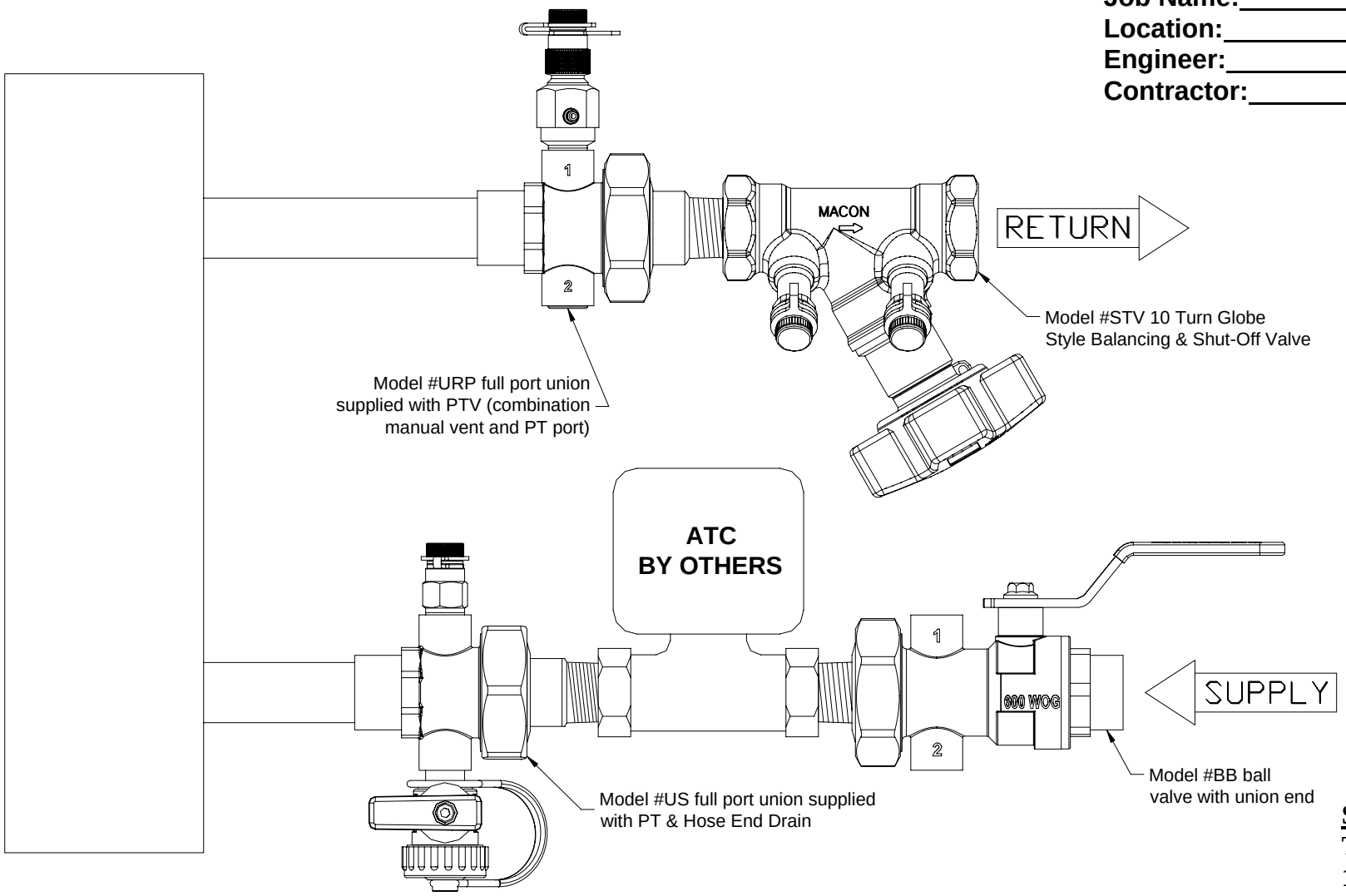

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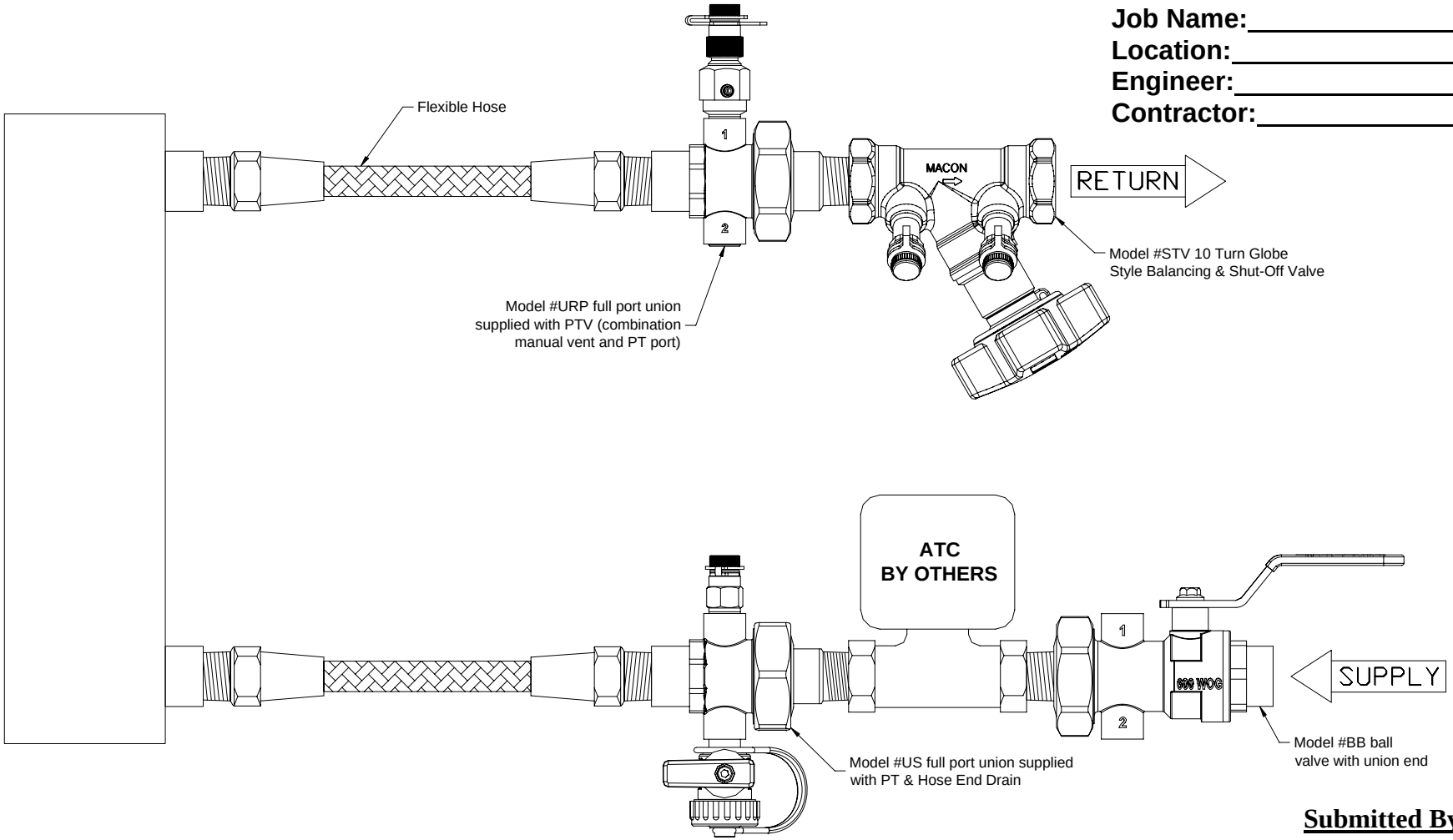
Location:_____
Engineer:_____
Contractor:_____



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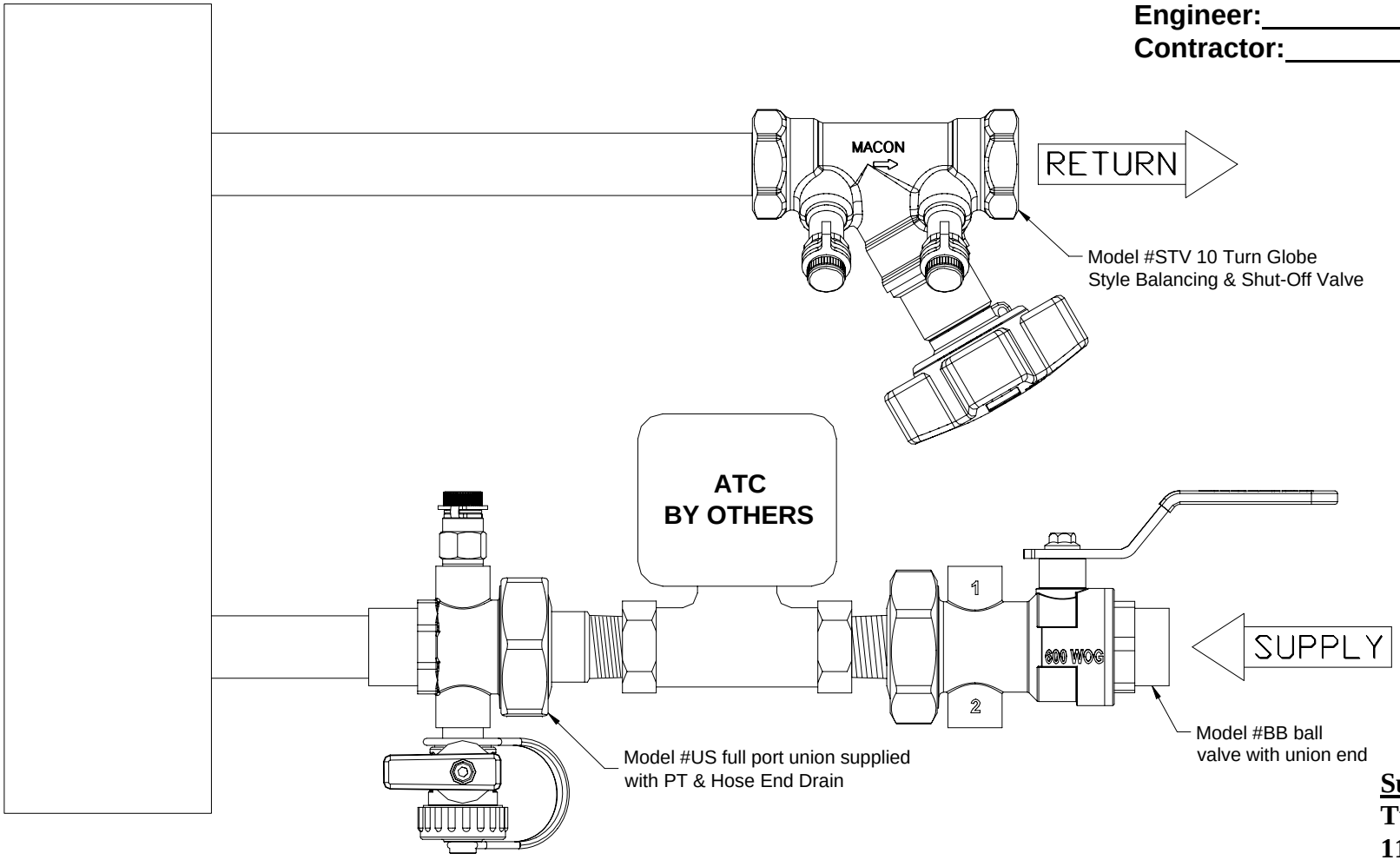

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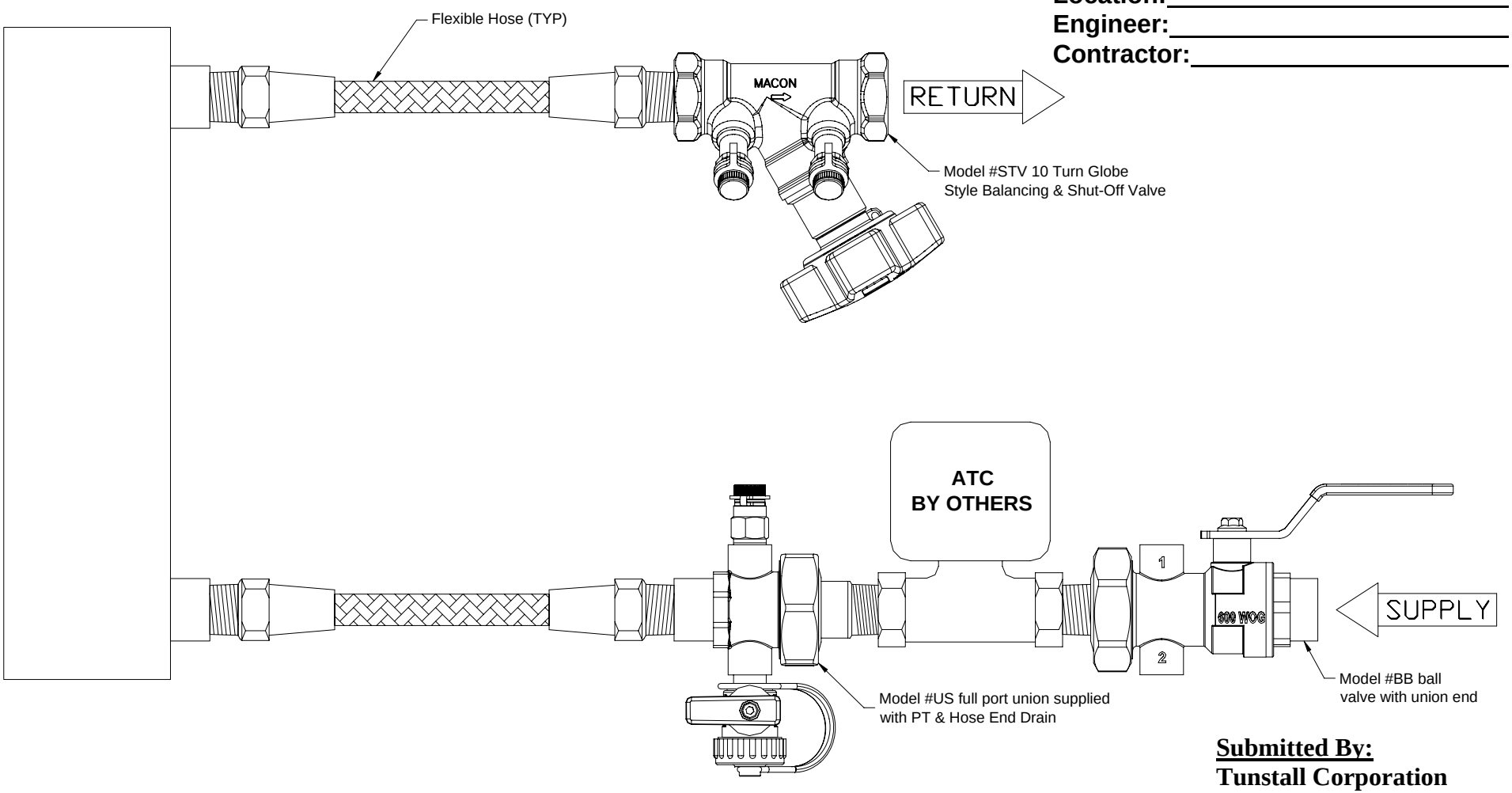

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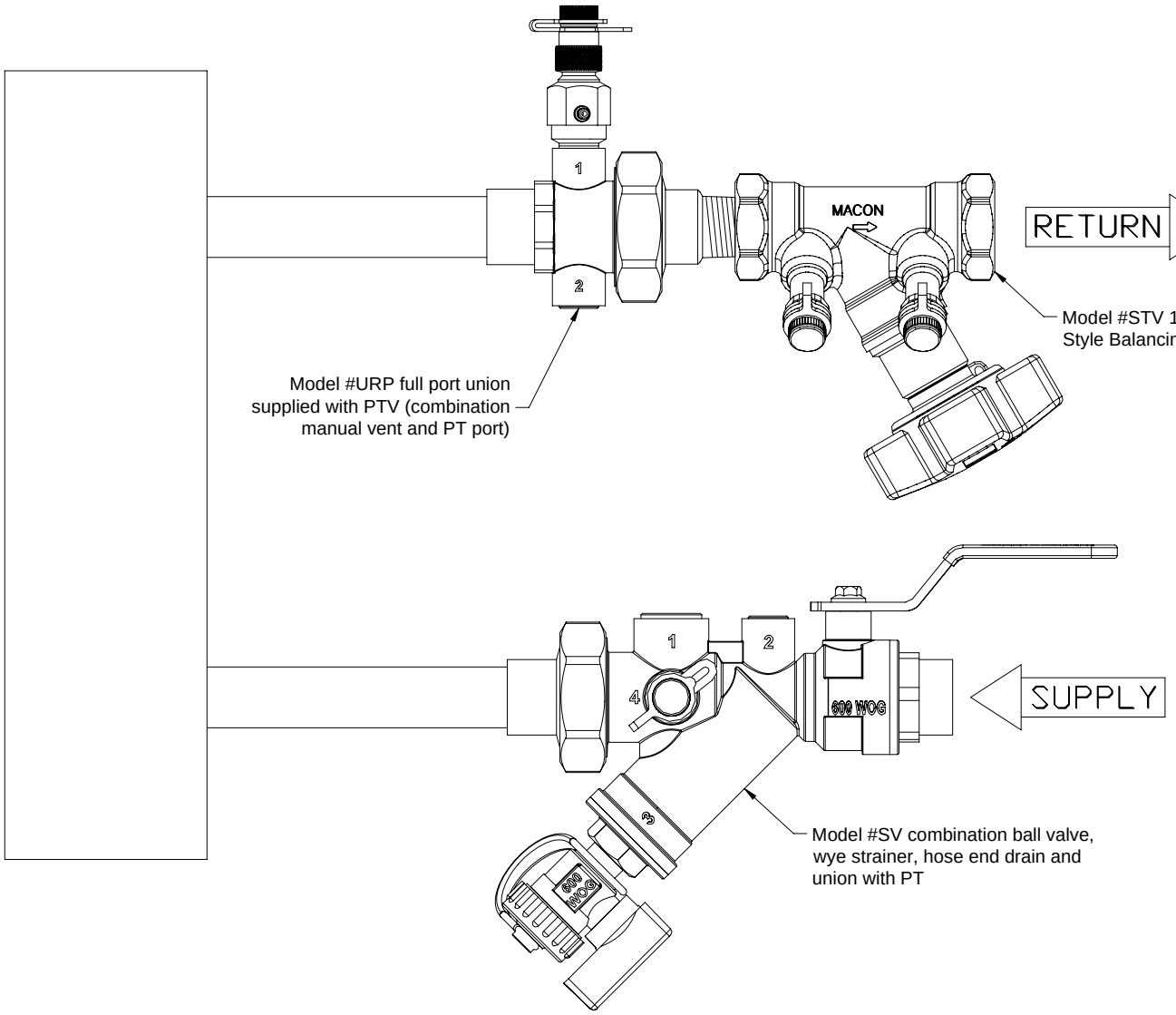
Valve Package (Model # XXS-CS)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Valve Package (Model # XXUS-CS)

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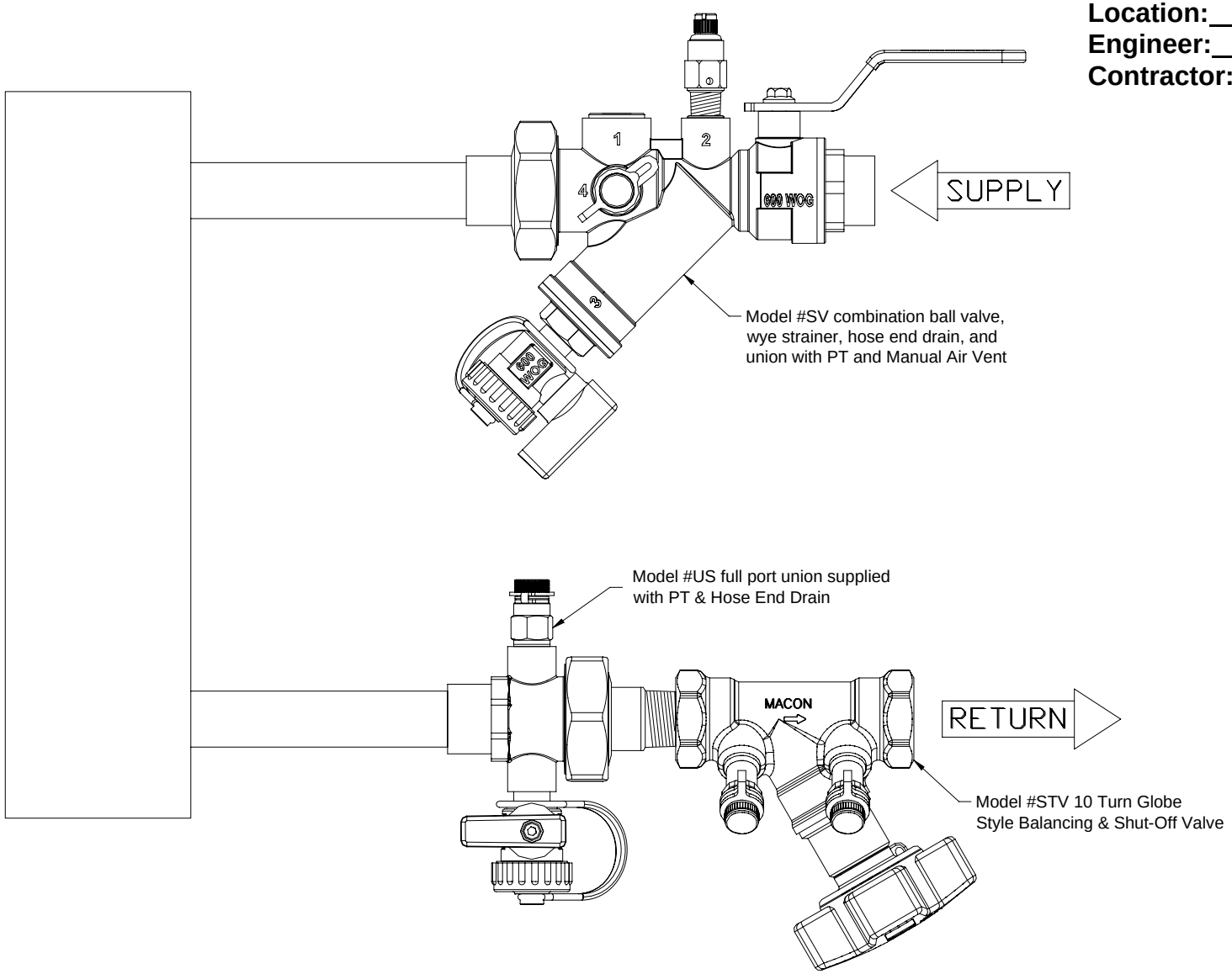
Location:_____
Engineer:_____
Contractor:_____



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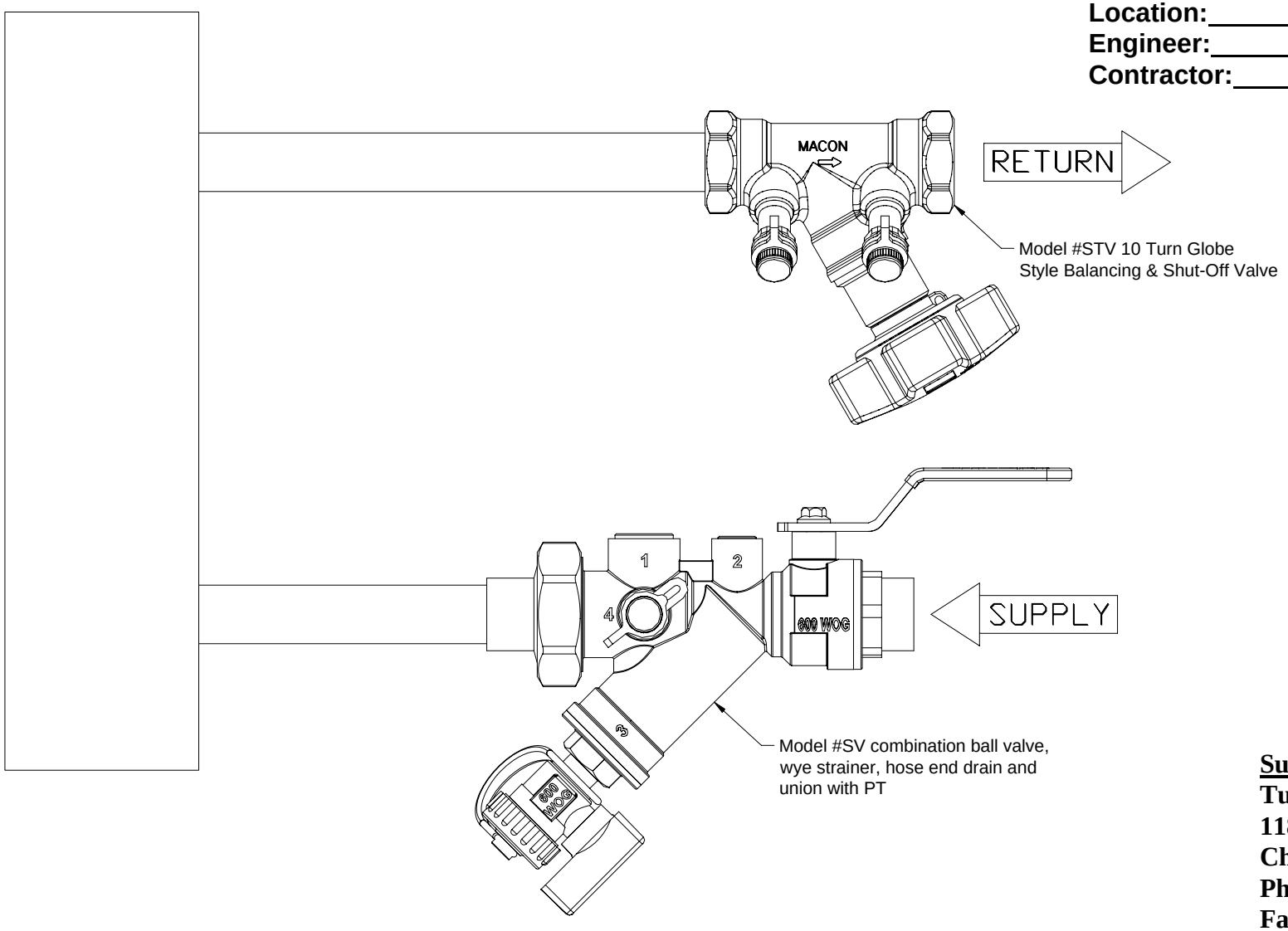
Valve Package (Model # XS-CSX)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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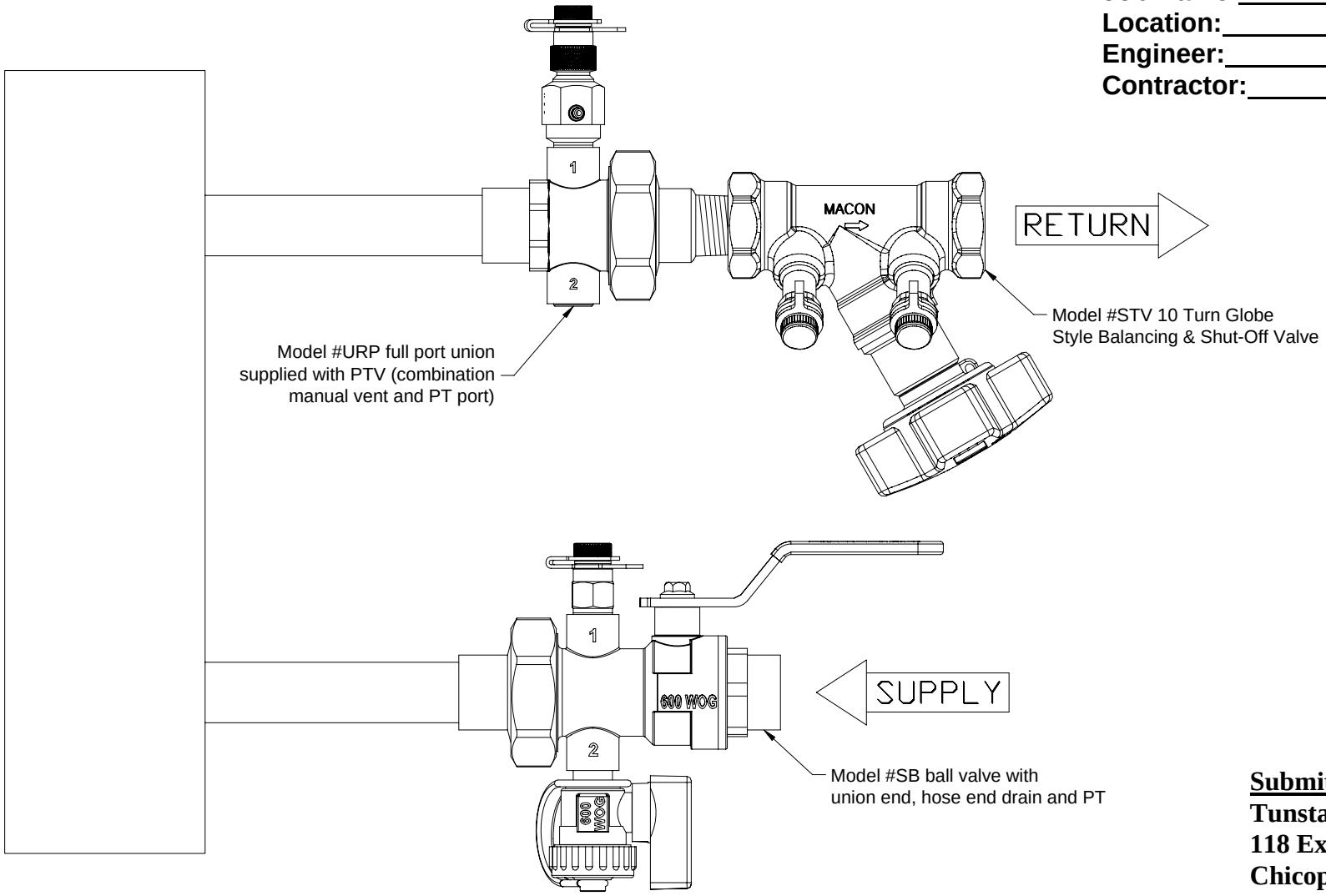
Valve Package (Model # XXB-CS)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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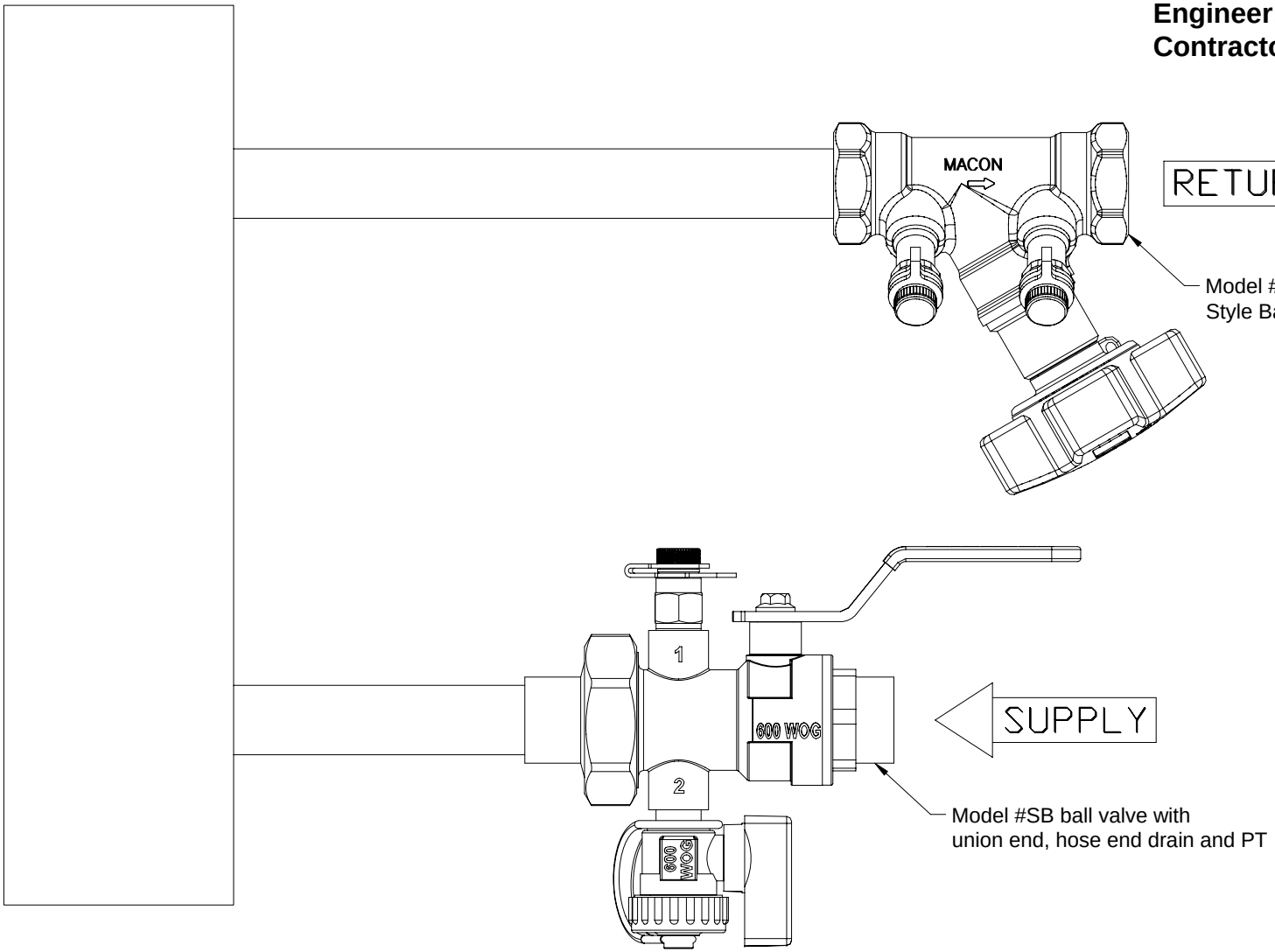
Valve Package (Model # XB-CSX)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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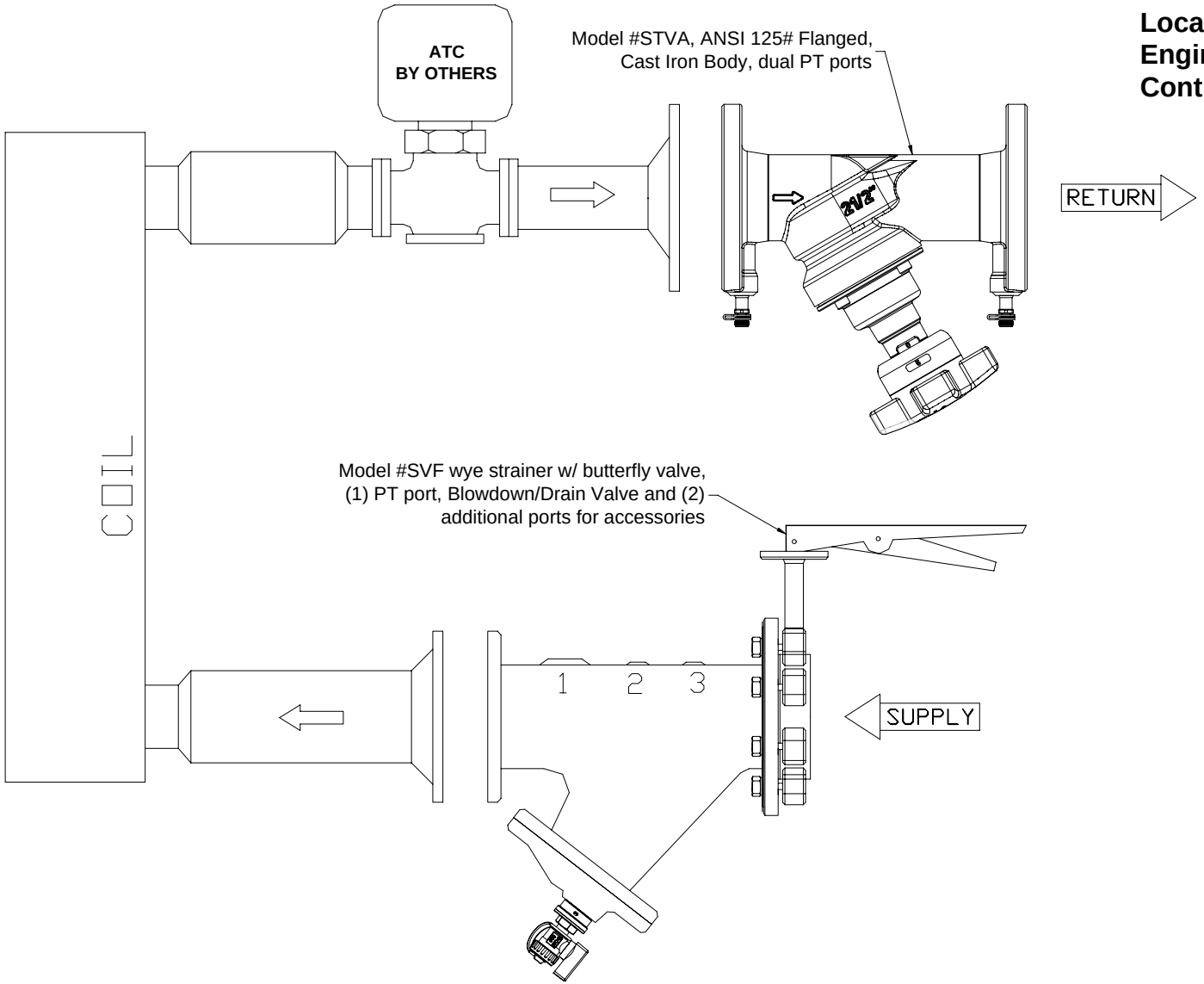
Valve Package (Model #STVA w/ SVF)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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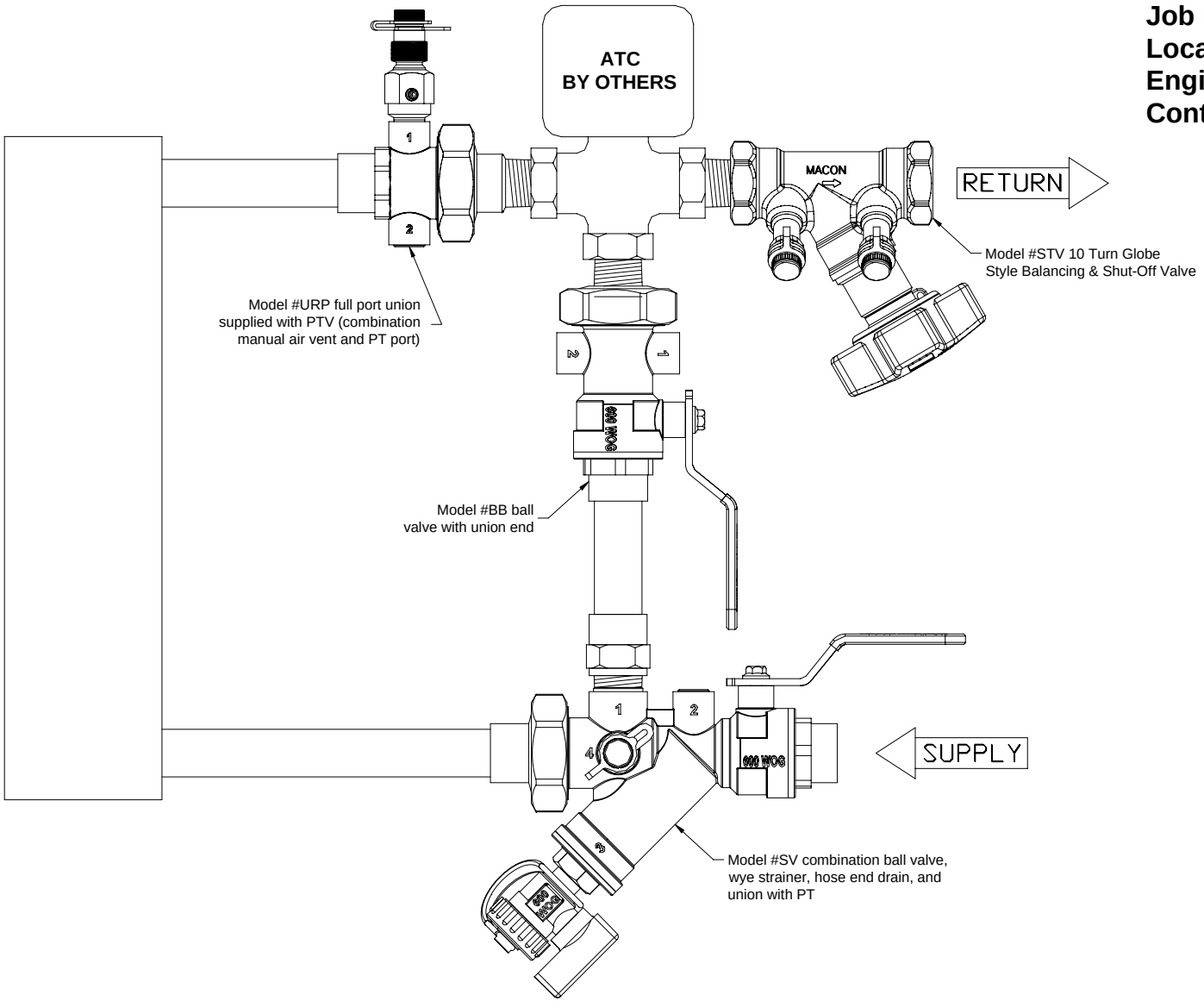
Valve Package (Model # 3RS-CS)



Job Name:_____
Location:_____
Engineer:_____
Contractor:_____

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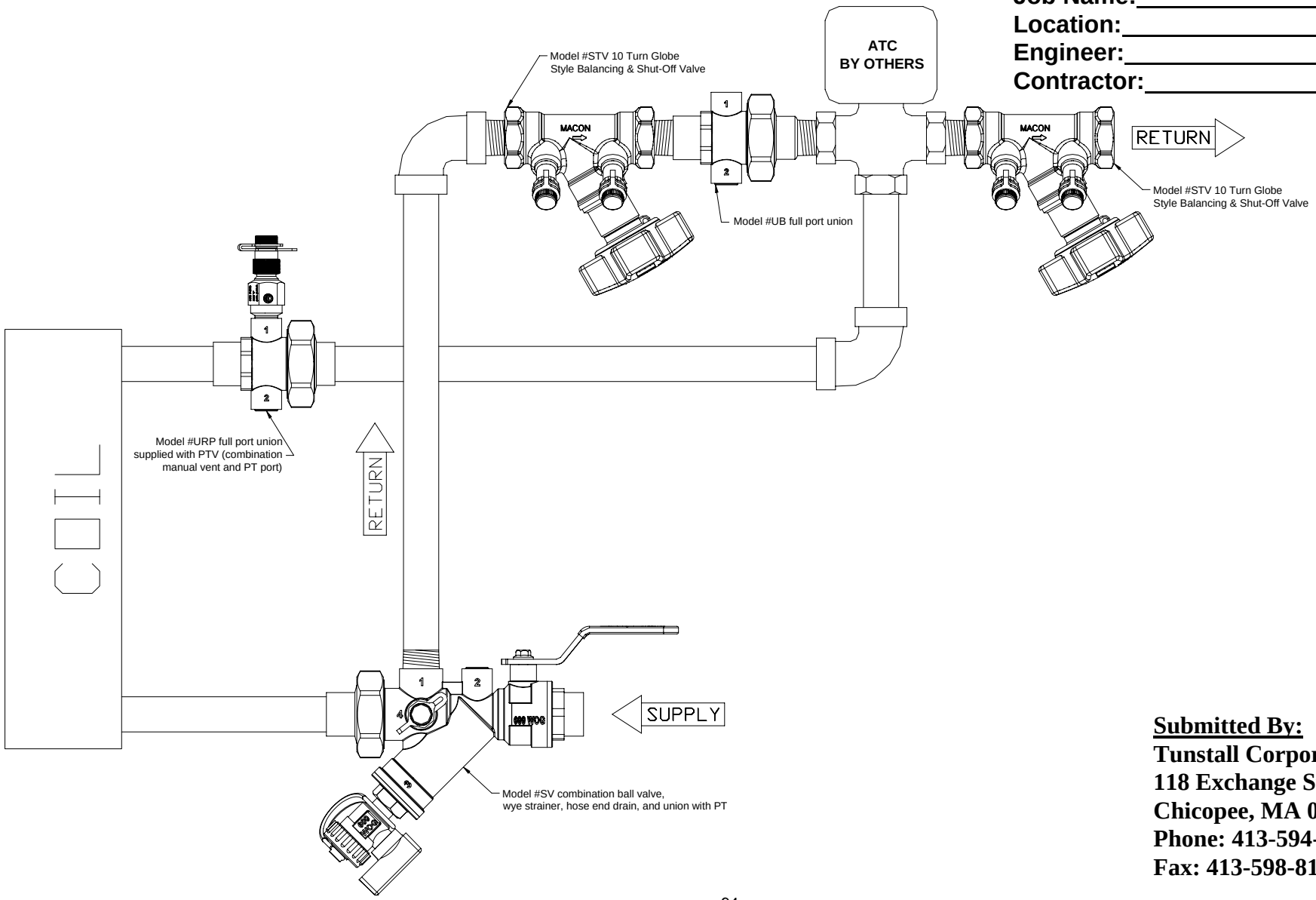
Valve Package (Model # 3RS-CS-A)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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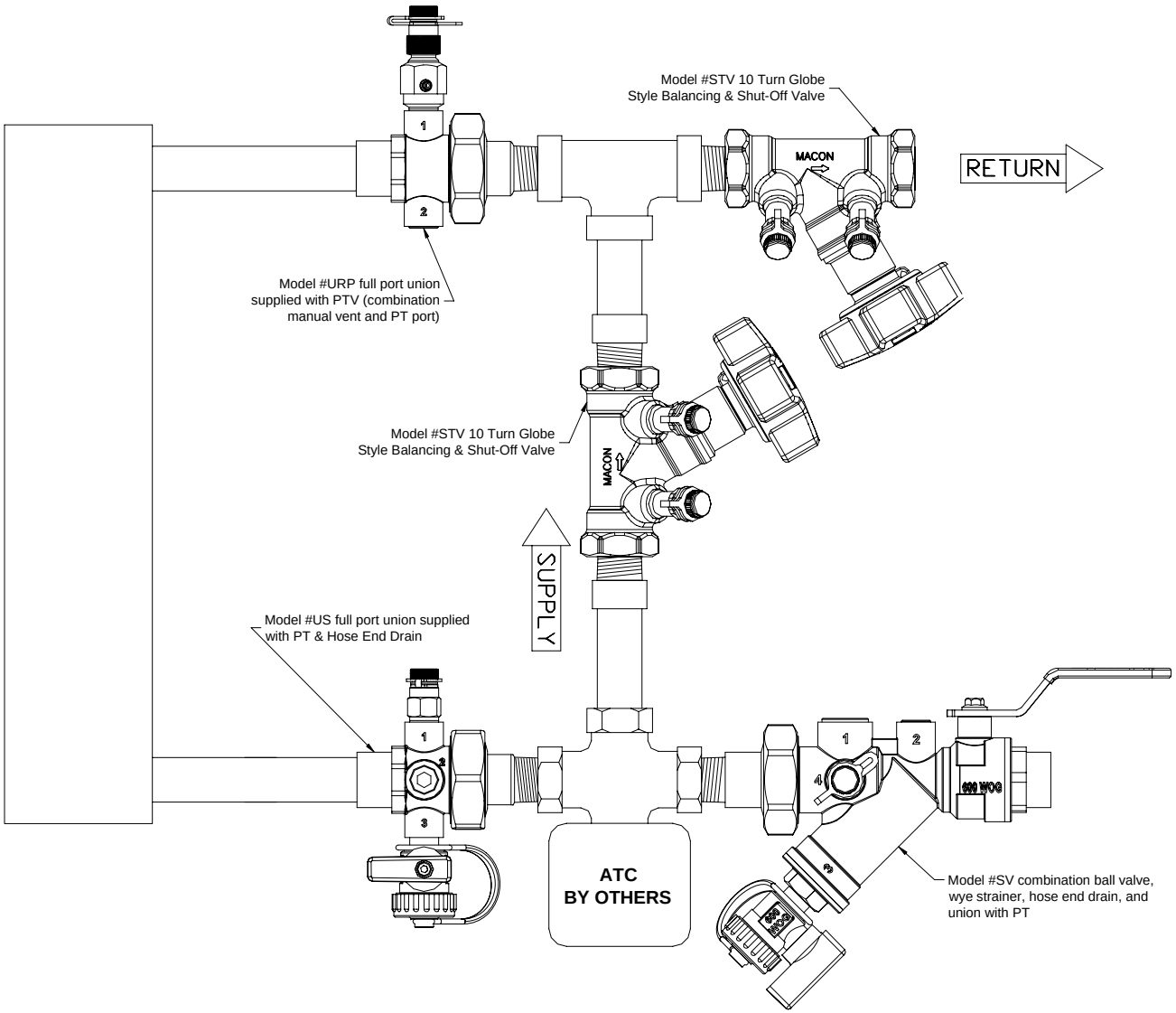
Valve Package (Model # 3SS-CS(2))

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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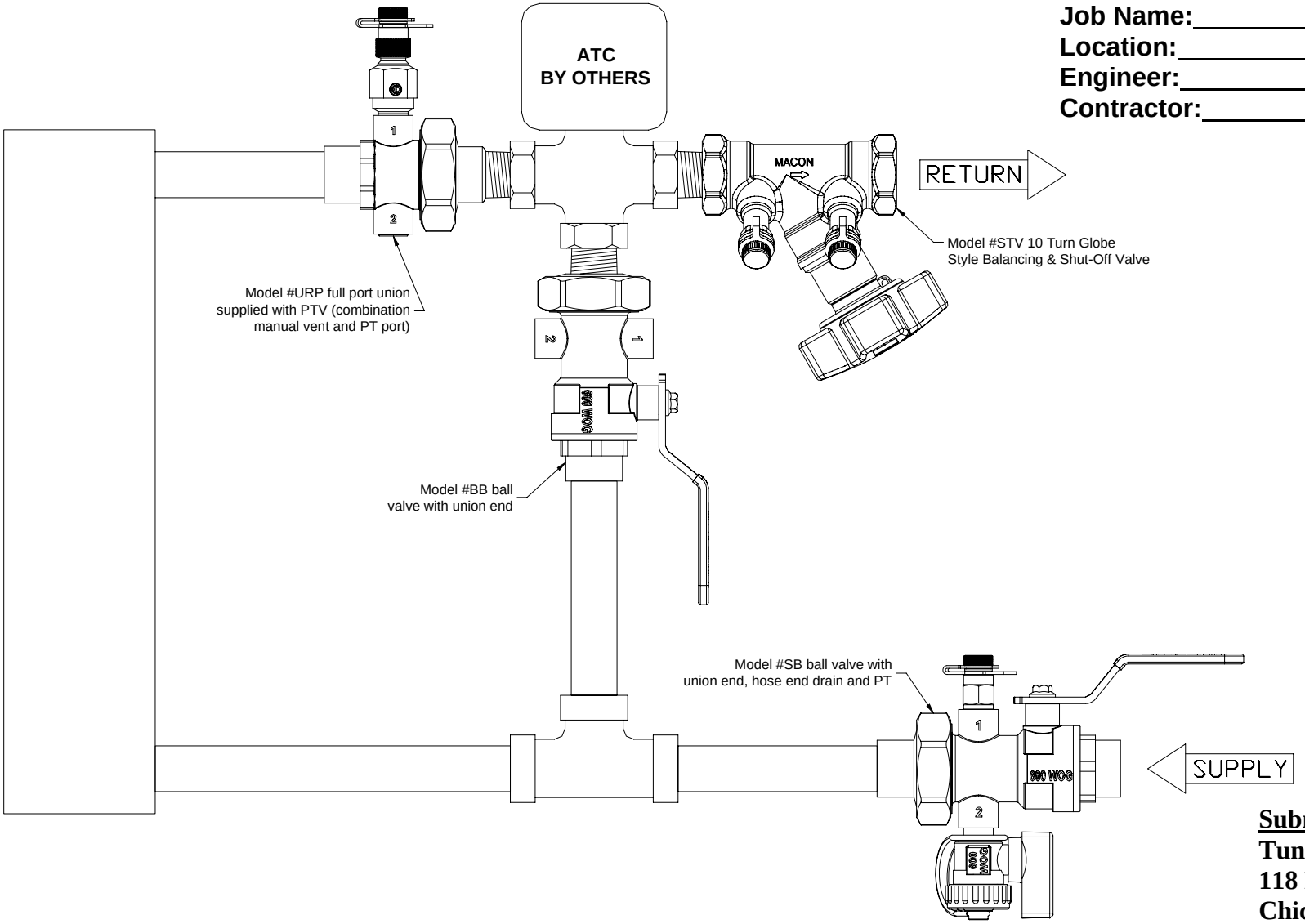
Valve Package (Model # 3RB-CS)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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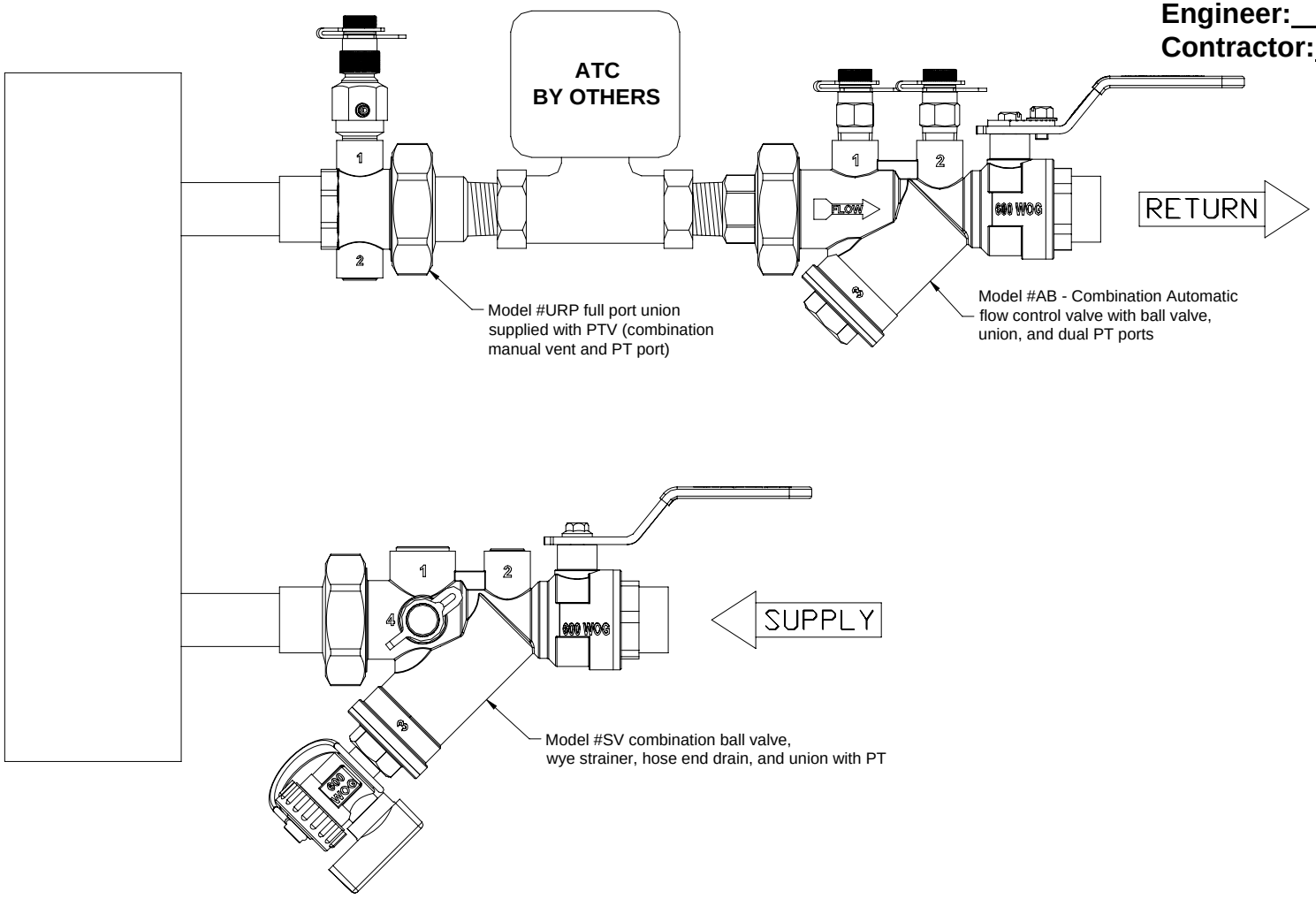
Valve Package (Model # 2RS-AB)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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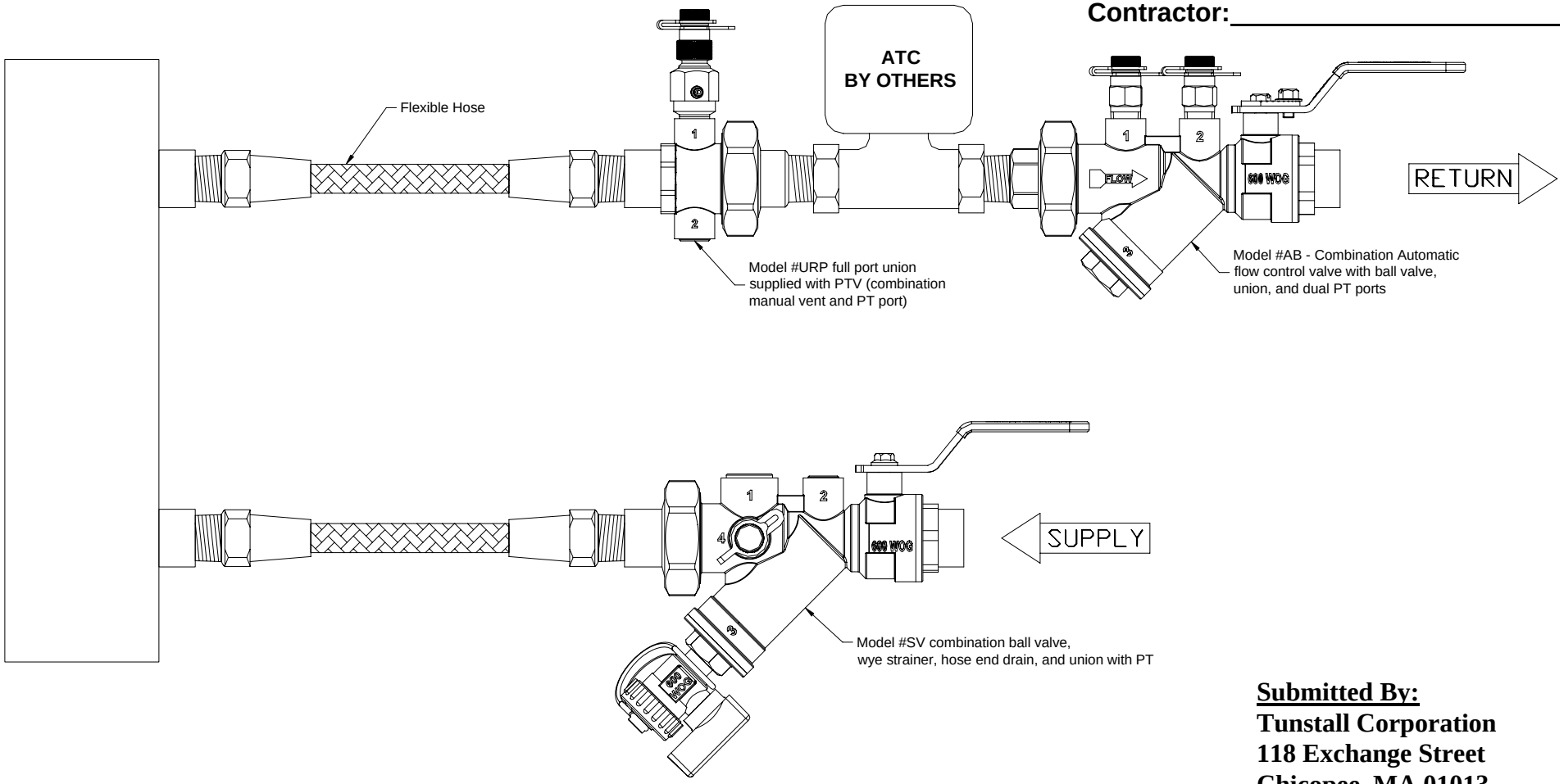
Valve Package (Model # 2RS-AB-FLEX)

Job Name:_____

Location:_____

Engineer:_____

Contractor:_____



Submitted By:

Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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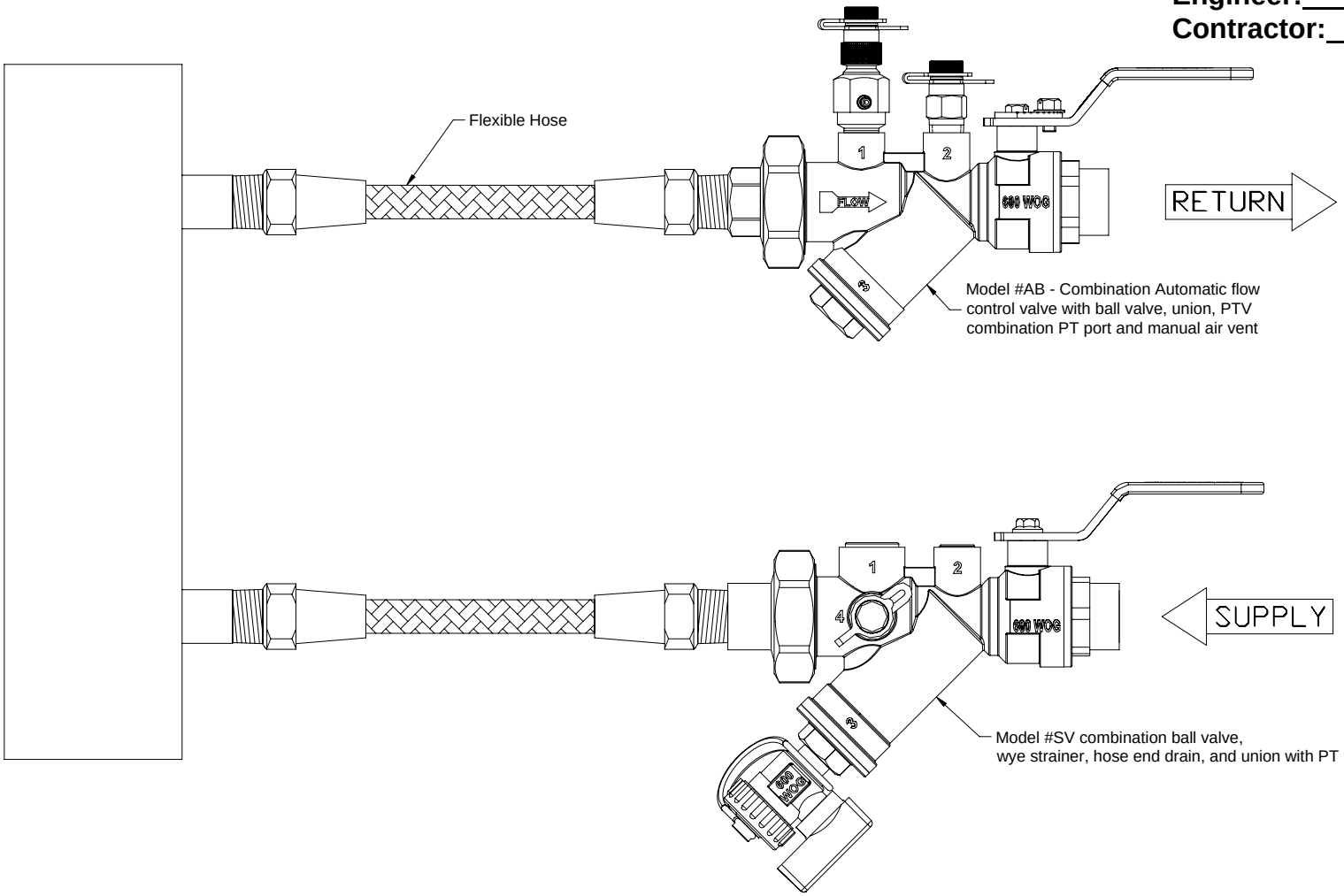
Valve Package (Model # 2RSX-AB-FLEX)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
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MACON® BALANCING
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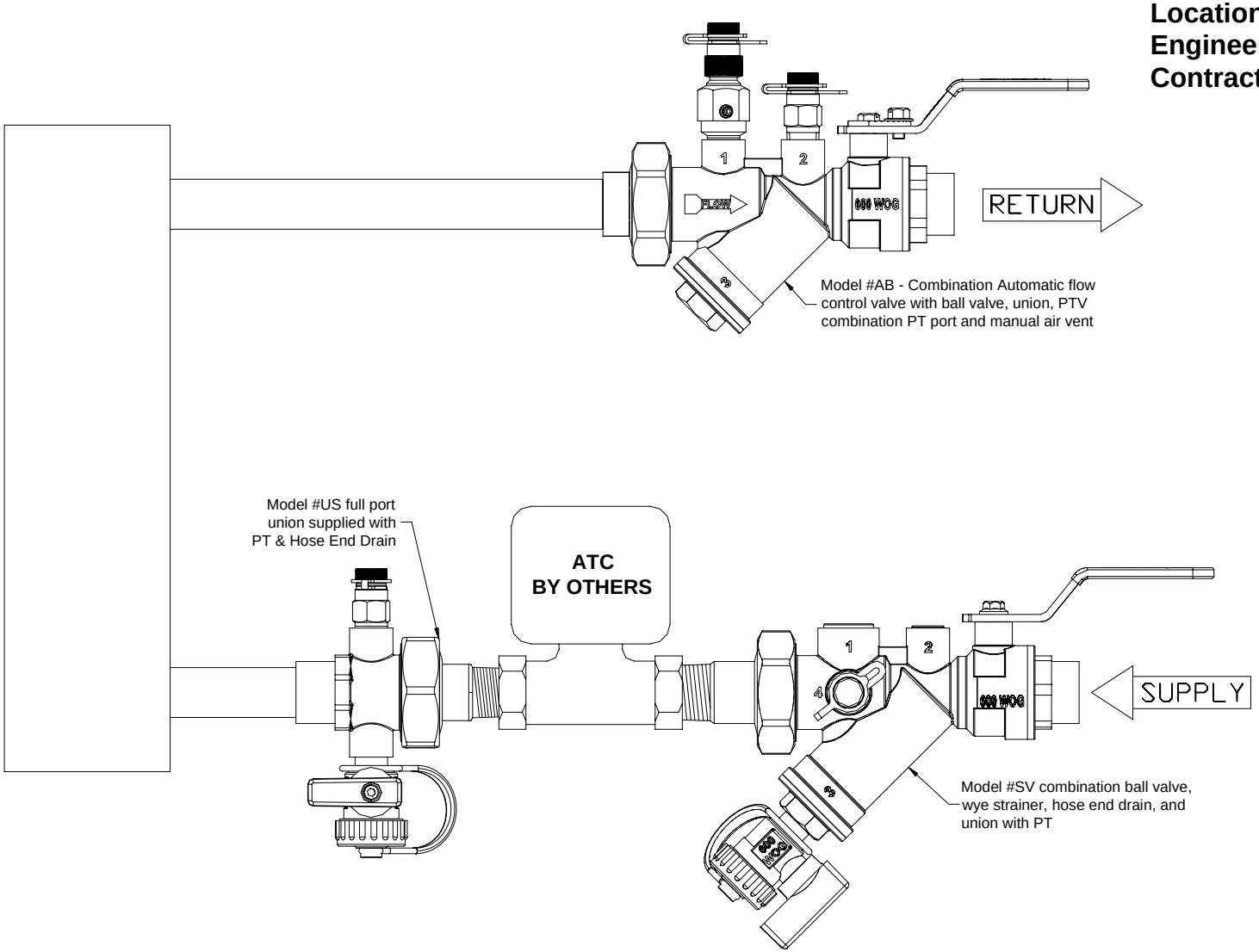
Valve Package (Model # 2SS-AB)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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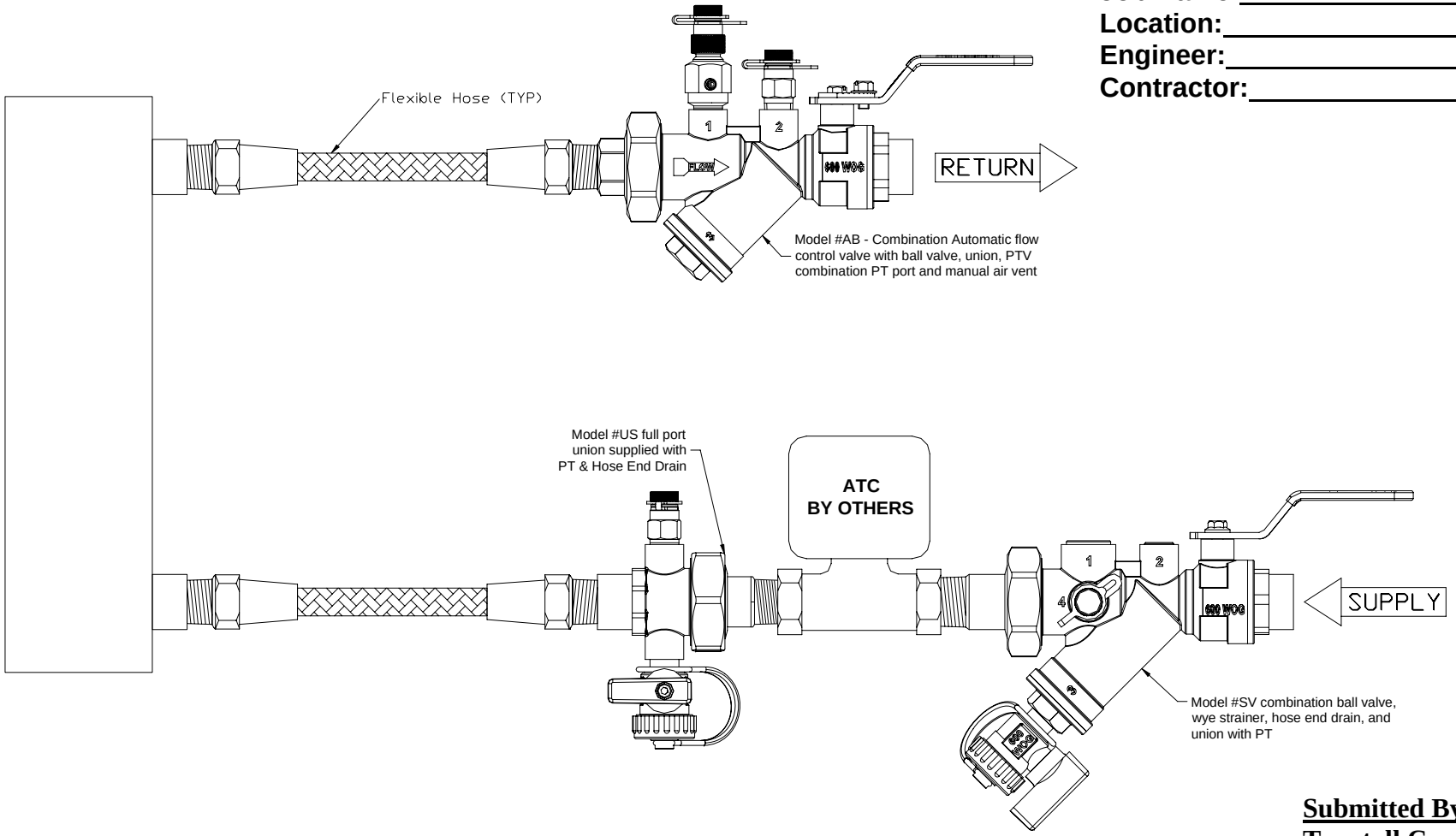
Valve Package (Model # 2SS-AB-FLEX)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

MACON® BALANCING
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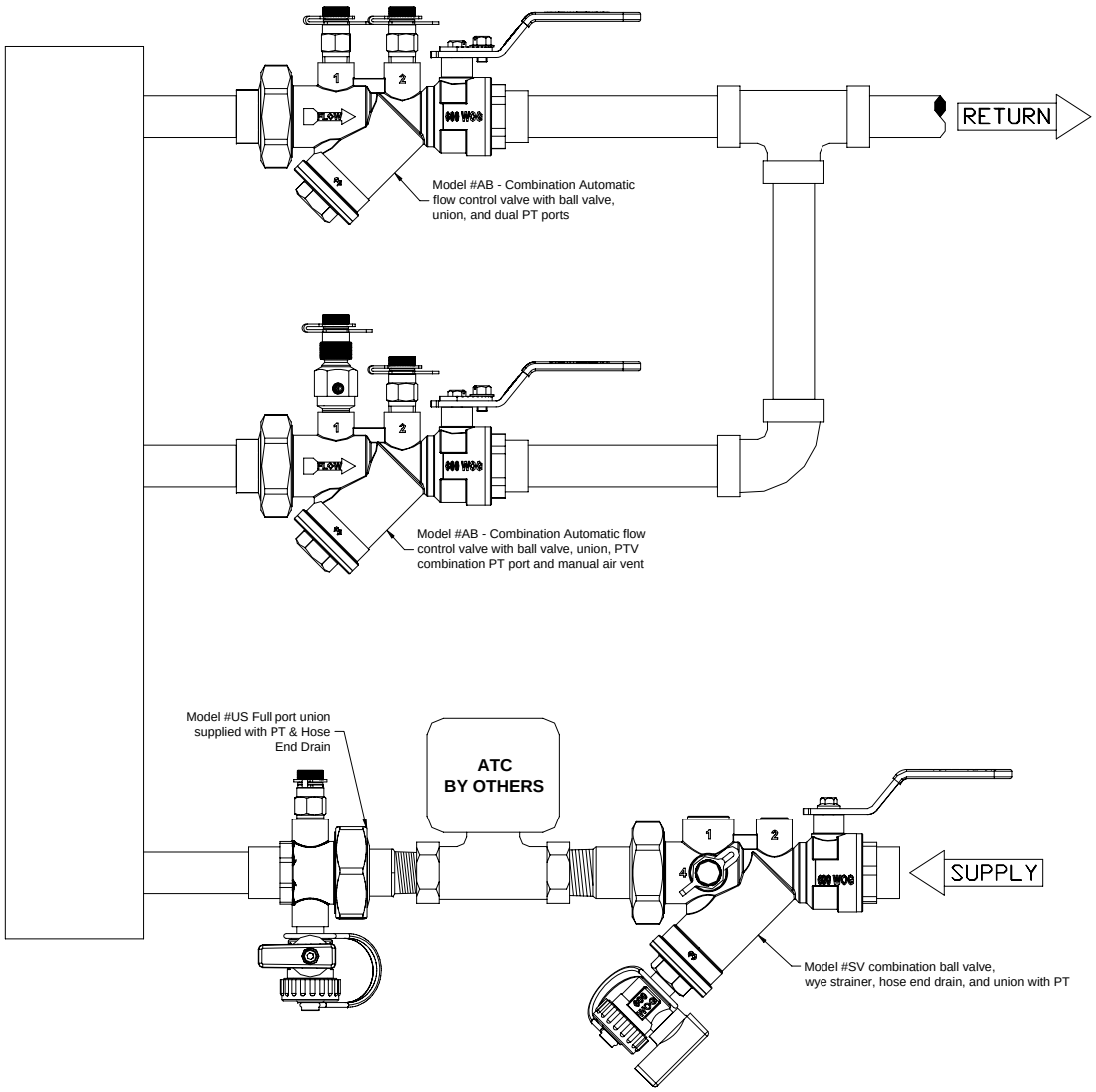
Valve Package (Model # 2SS-2AB)



Job Name:_____
Location:_____
Engineer:_____
Contractor:_____

Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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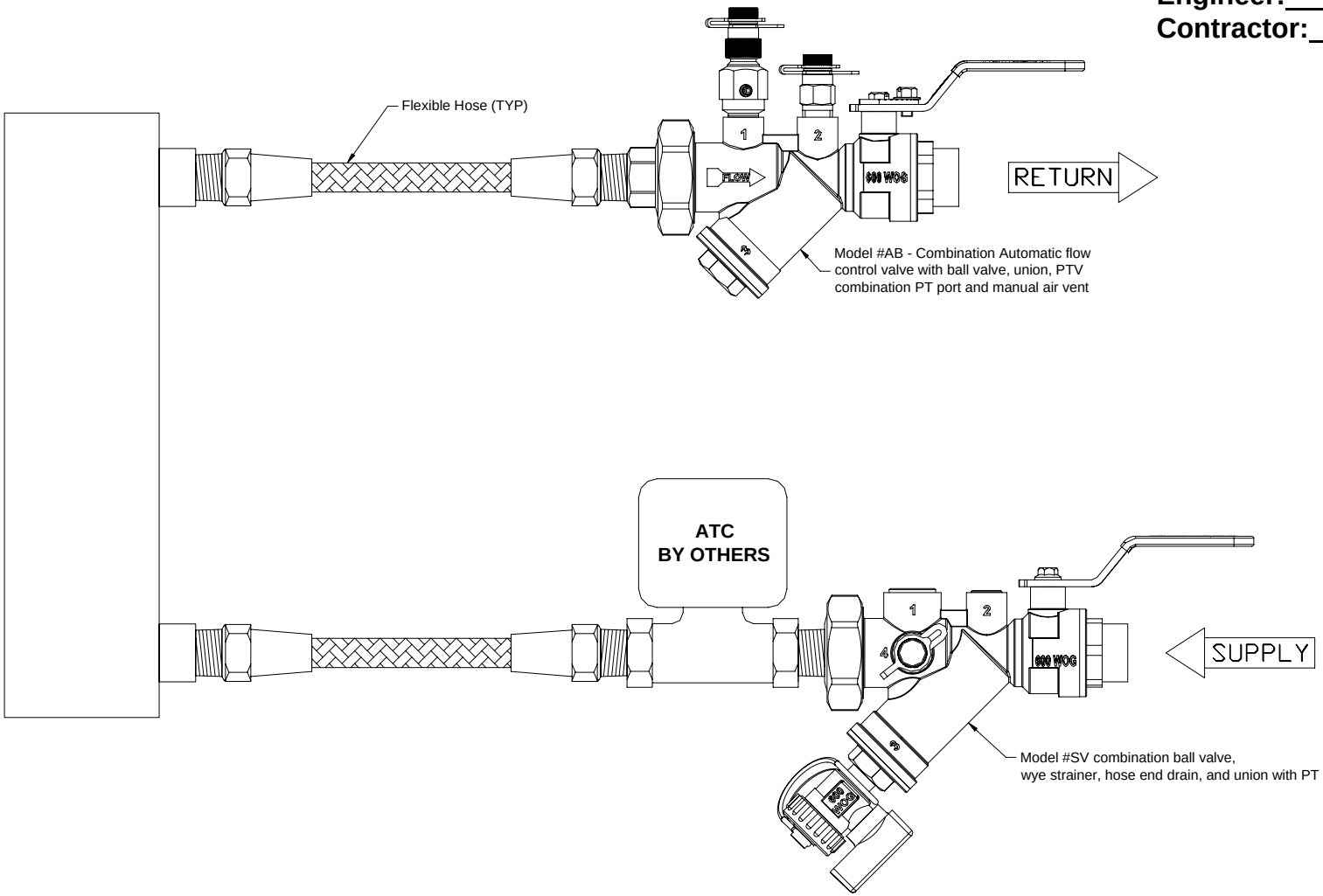
Valve Package (Model # 2SSX-AB-FLEX)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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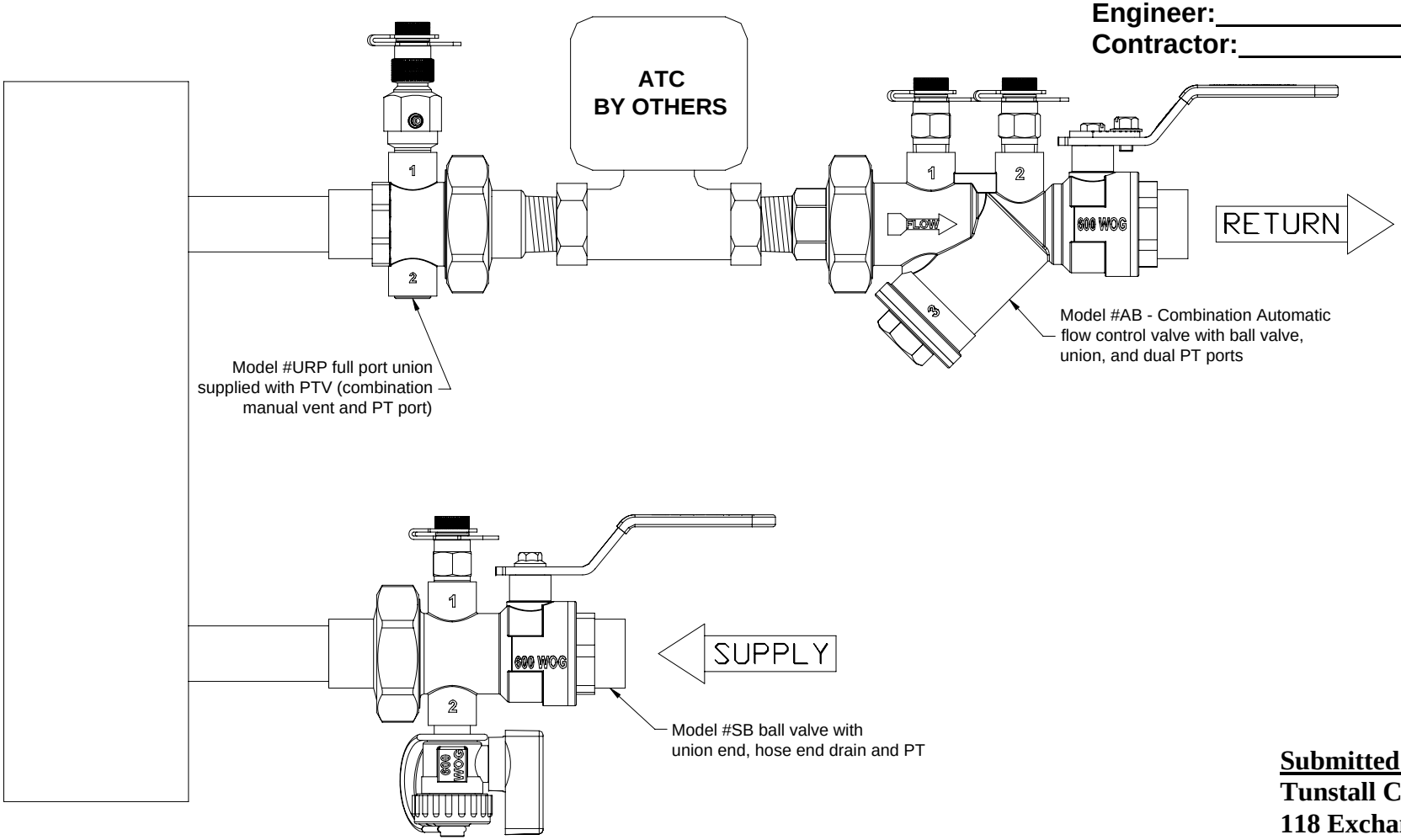
Valve Package (Model # 2RB-AB)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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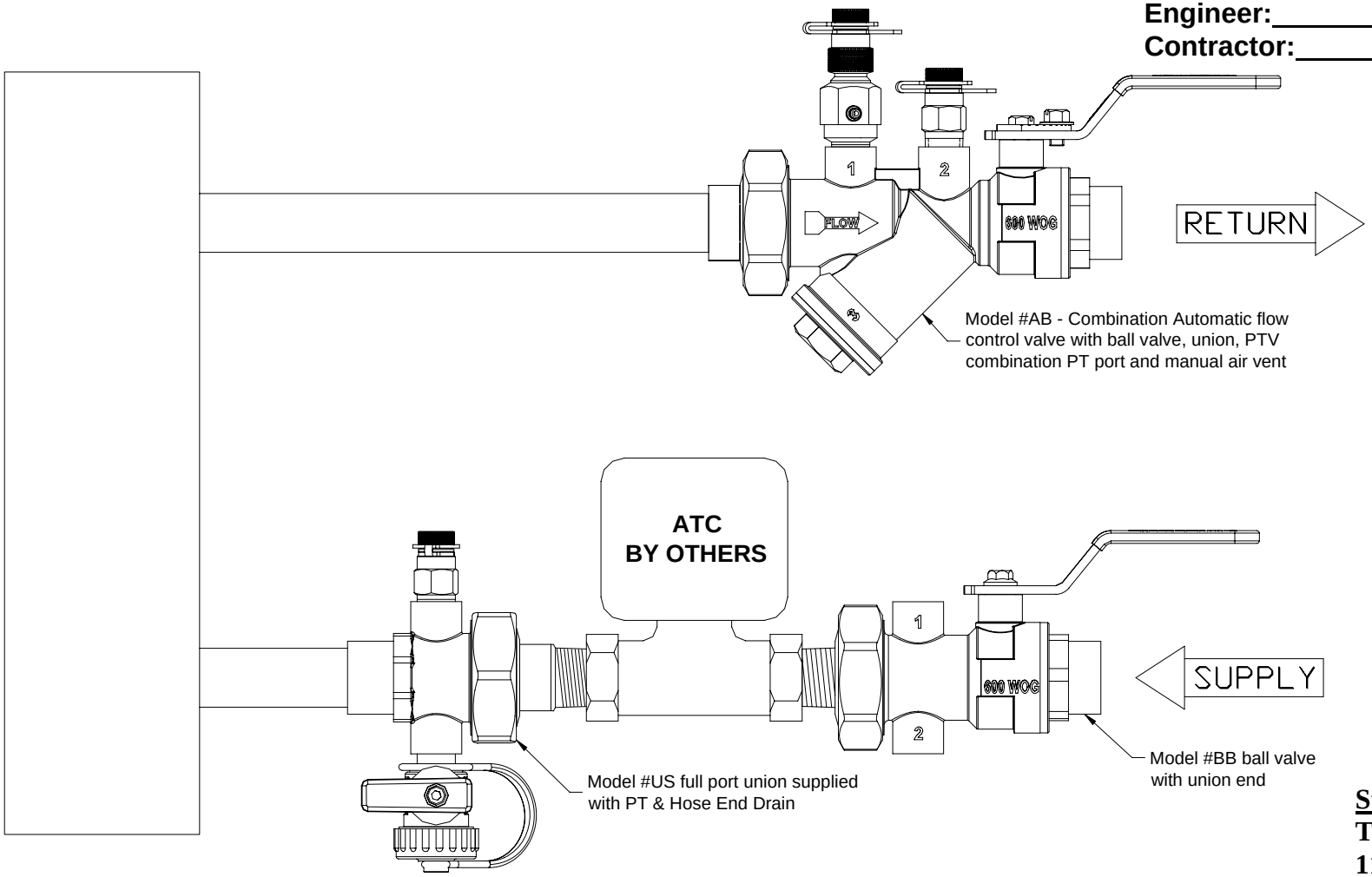
Valve Package (Model # 2SB-AB)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
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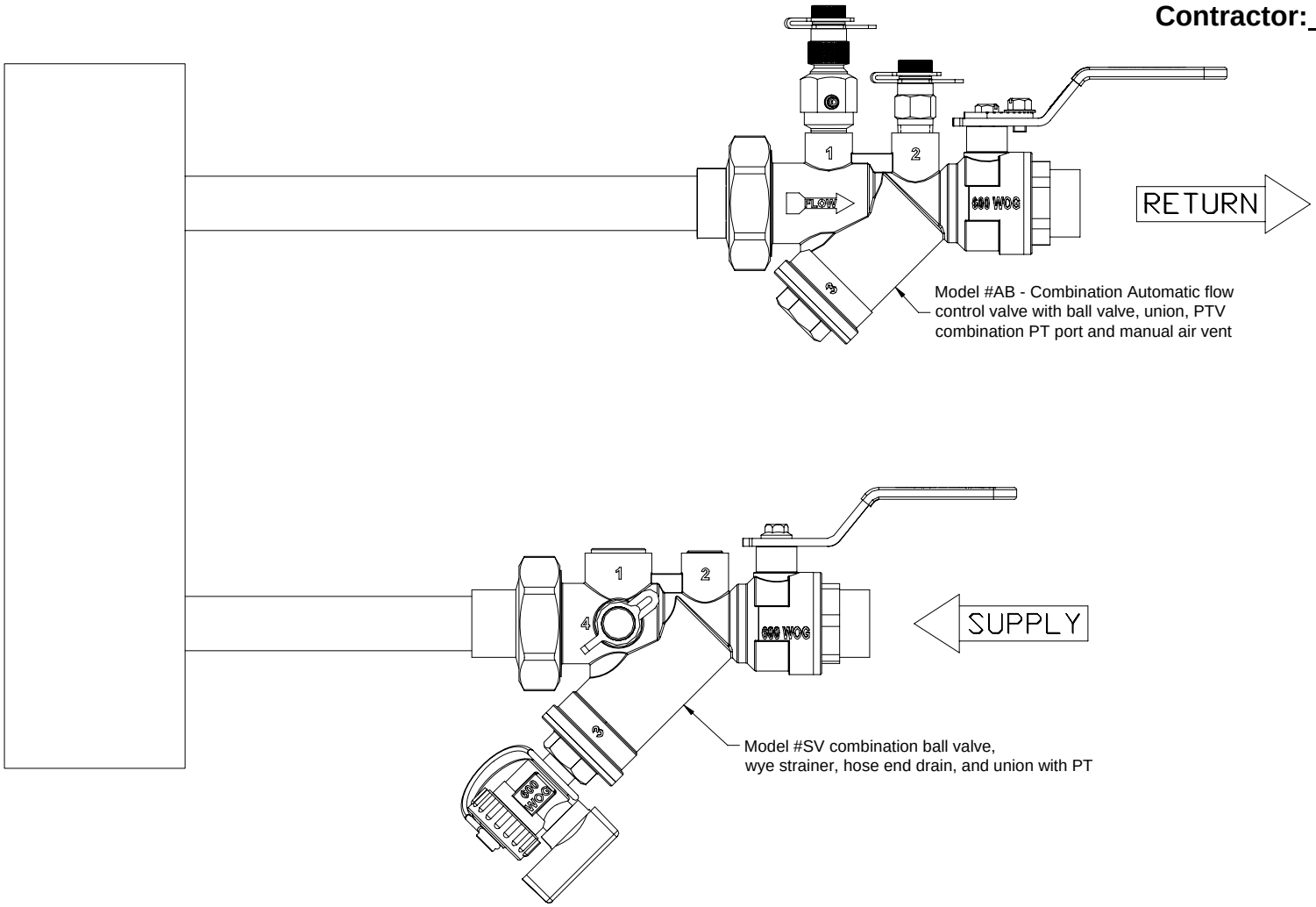
Valve Package (Model # XXS-AB)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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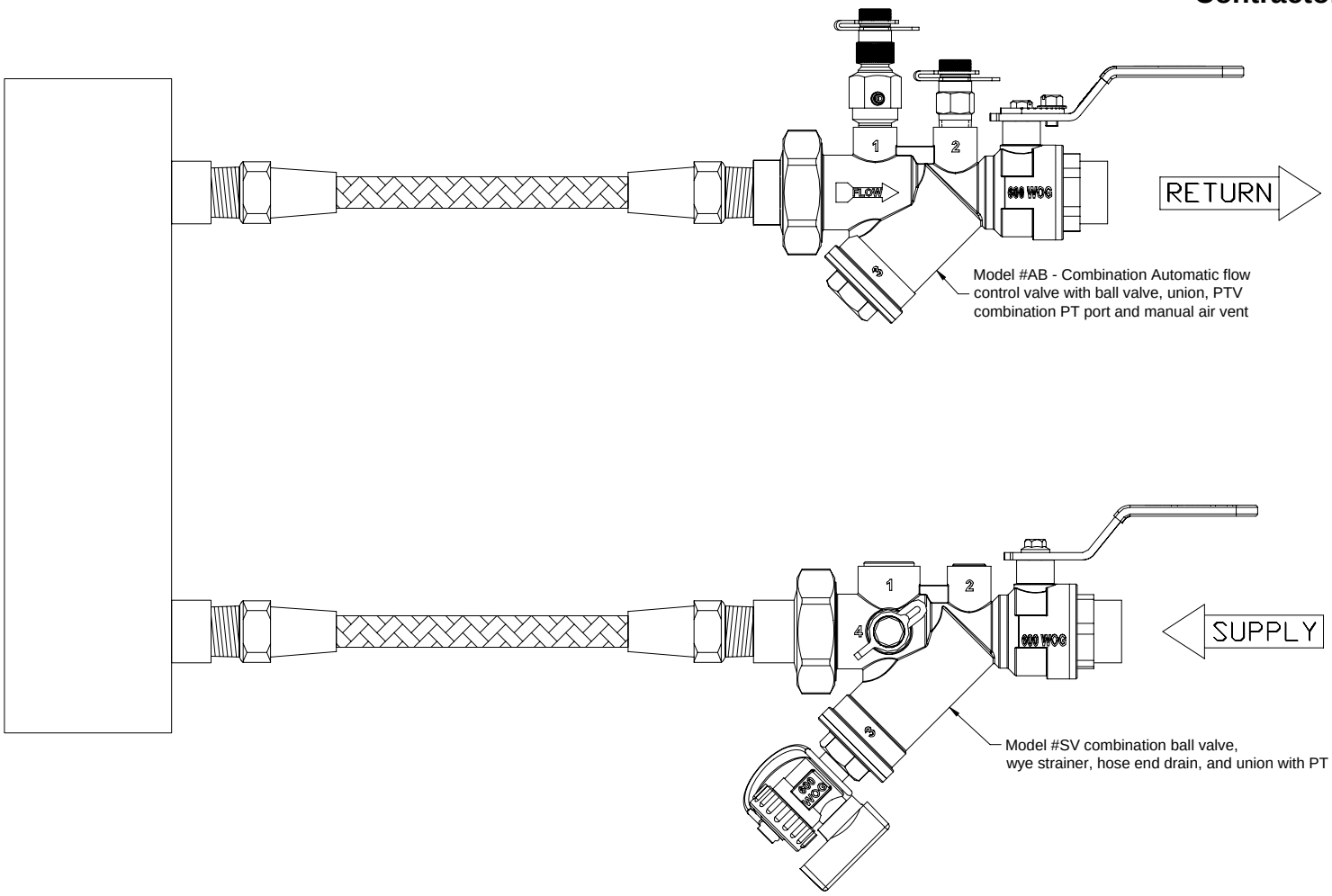
Valve Package (Model # XXS-AB-FLEX)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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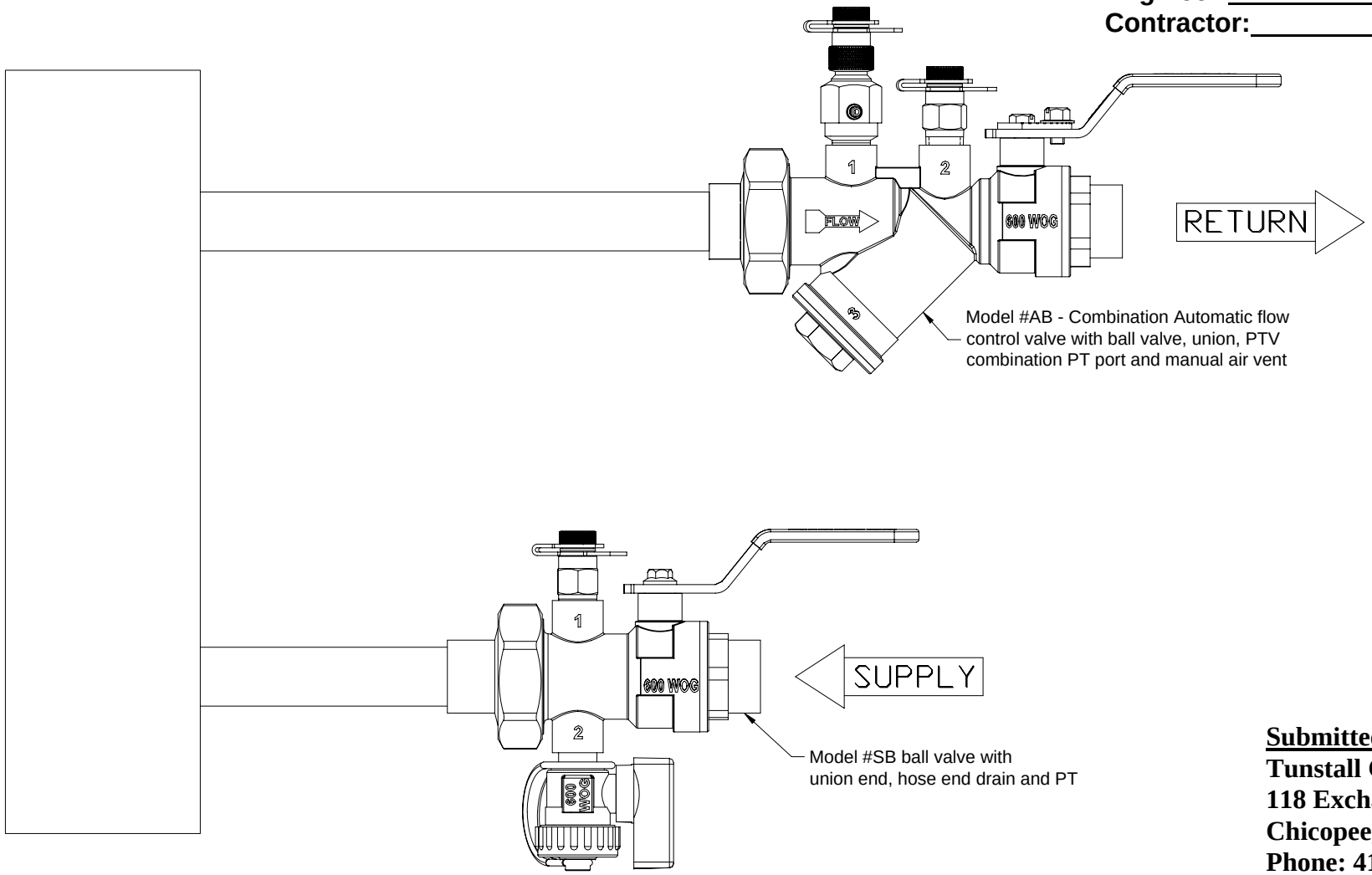
Valve Package (Model # XXB-AB)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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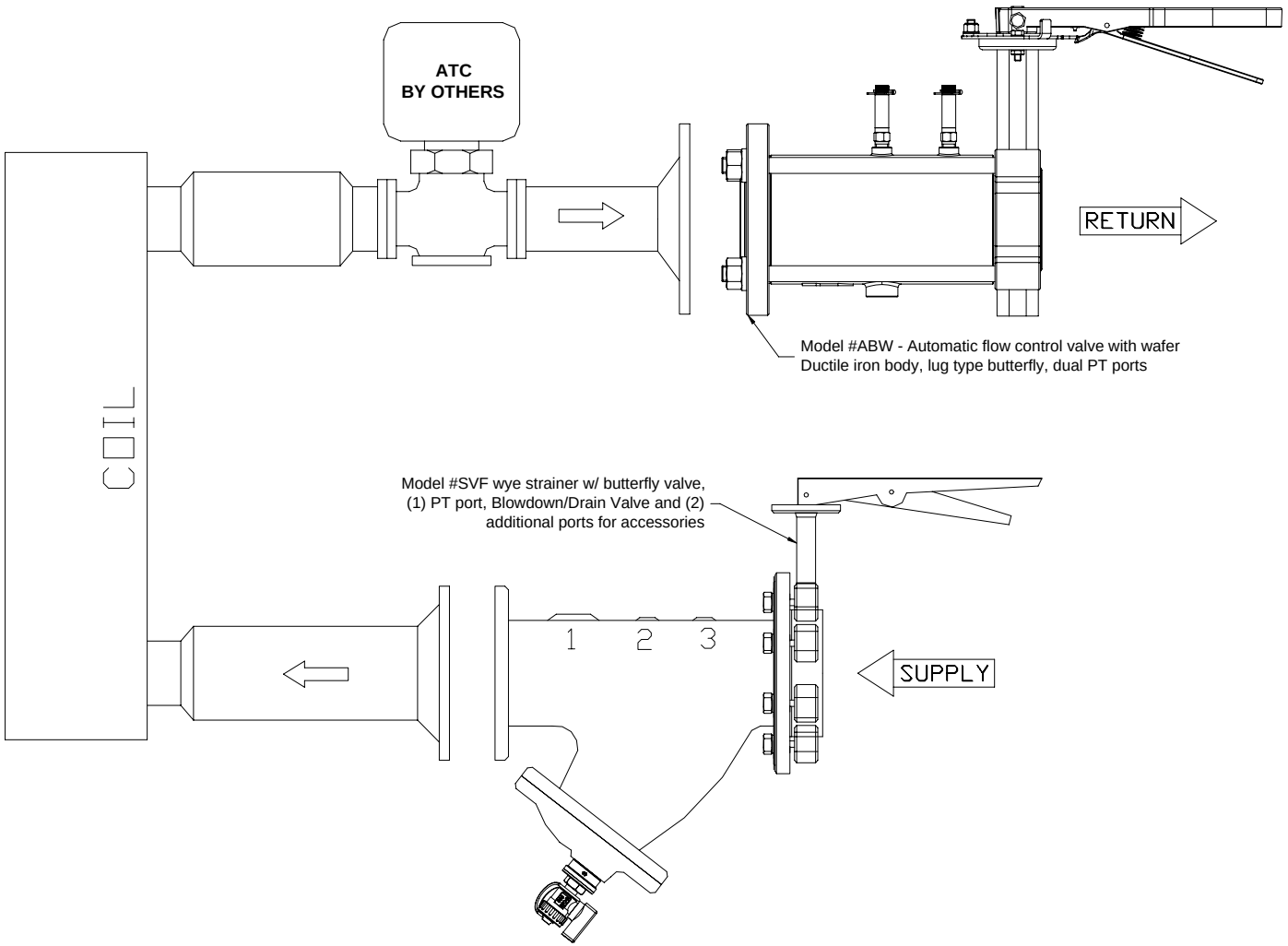
Valve Package (Model # ABW w/ SVF)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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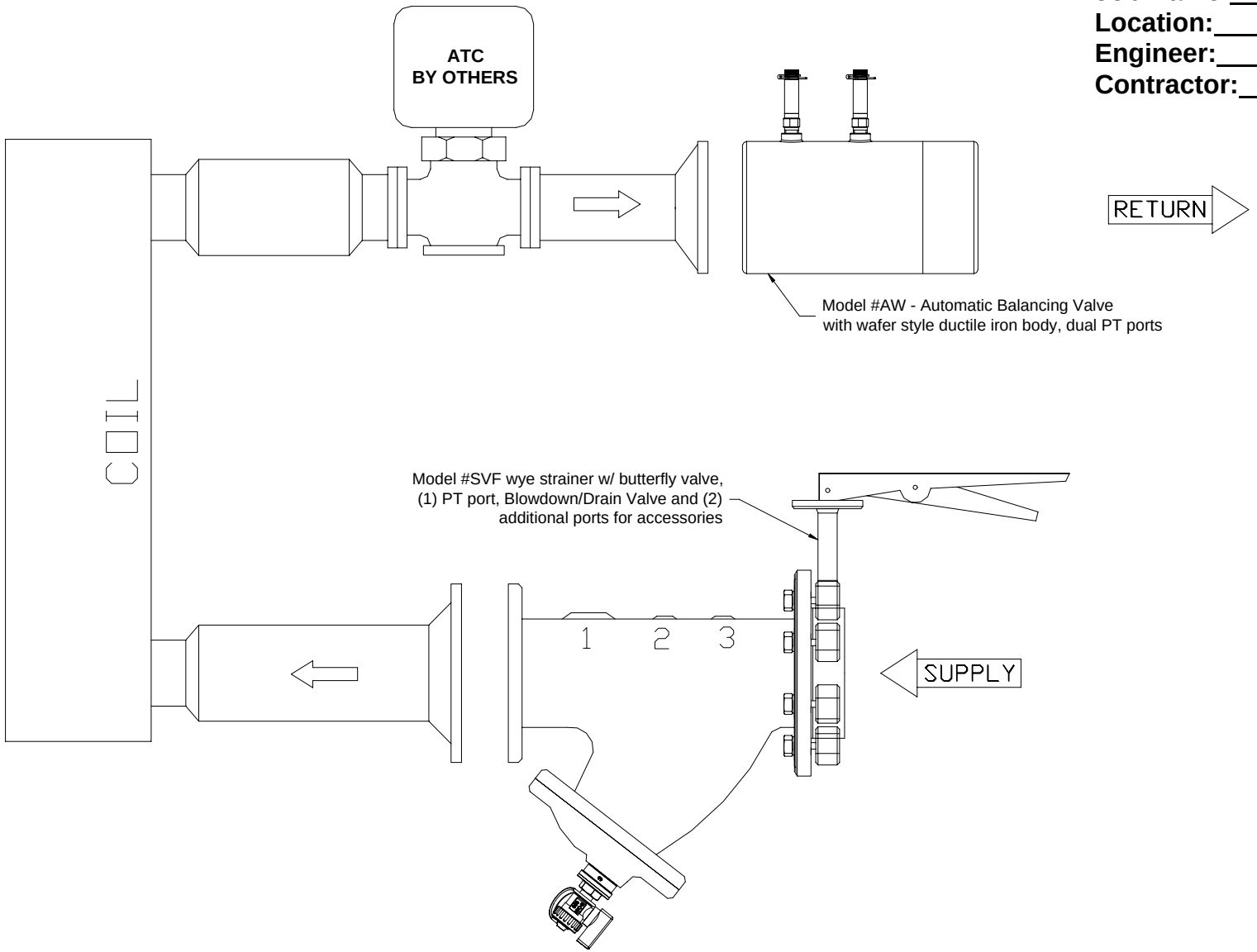
Valve Package (Model # AW w/ SVF)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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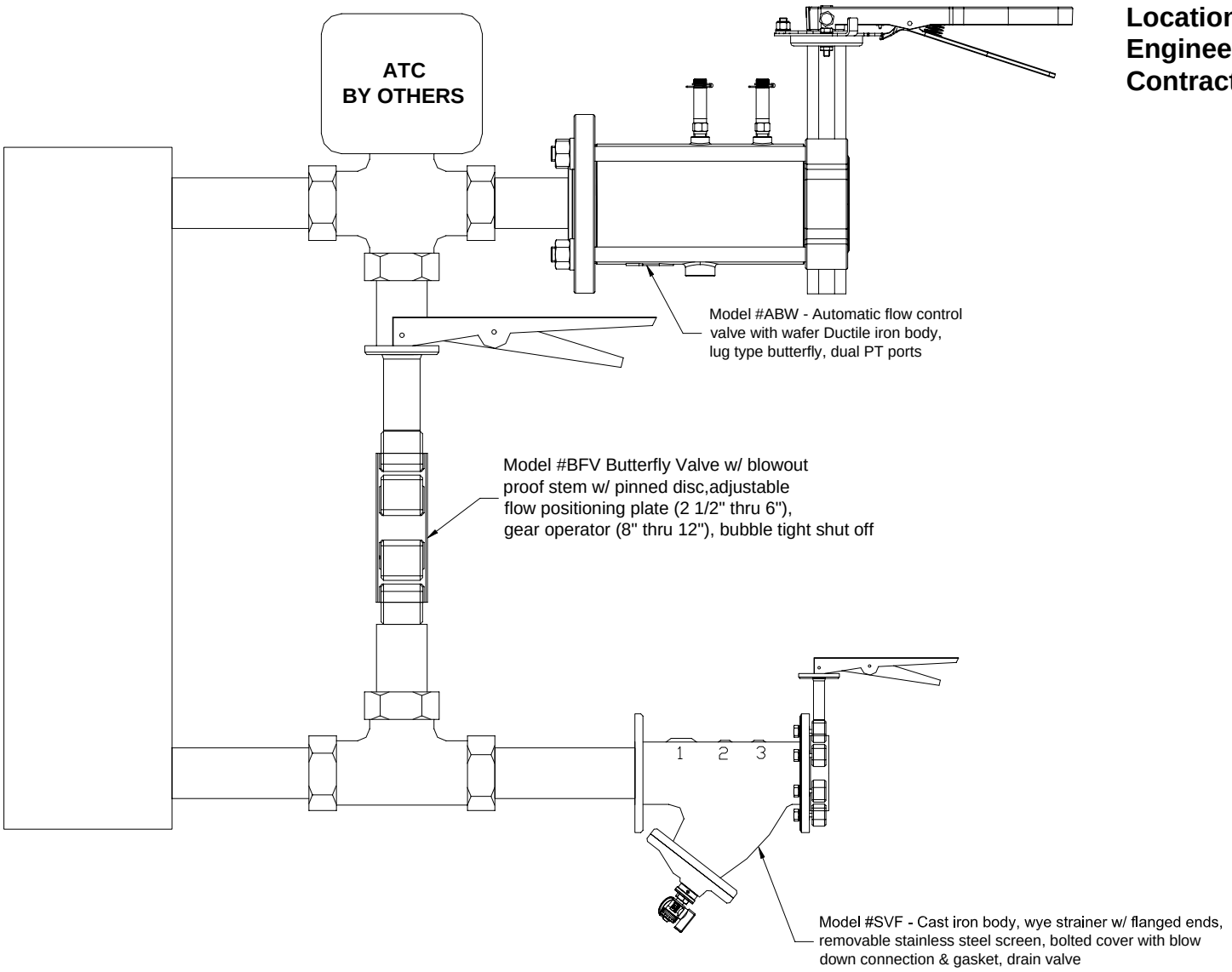
Valve Package (Model # 3BV-AB)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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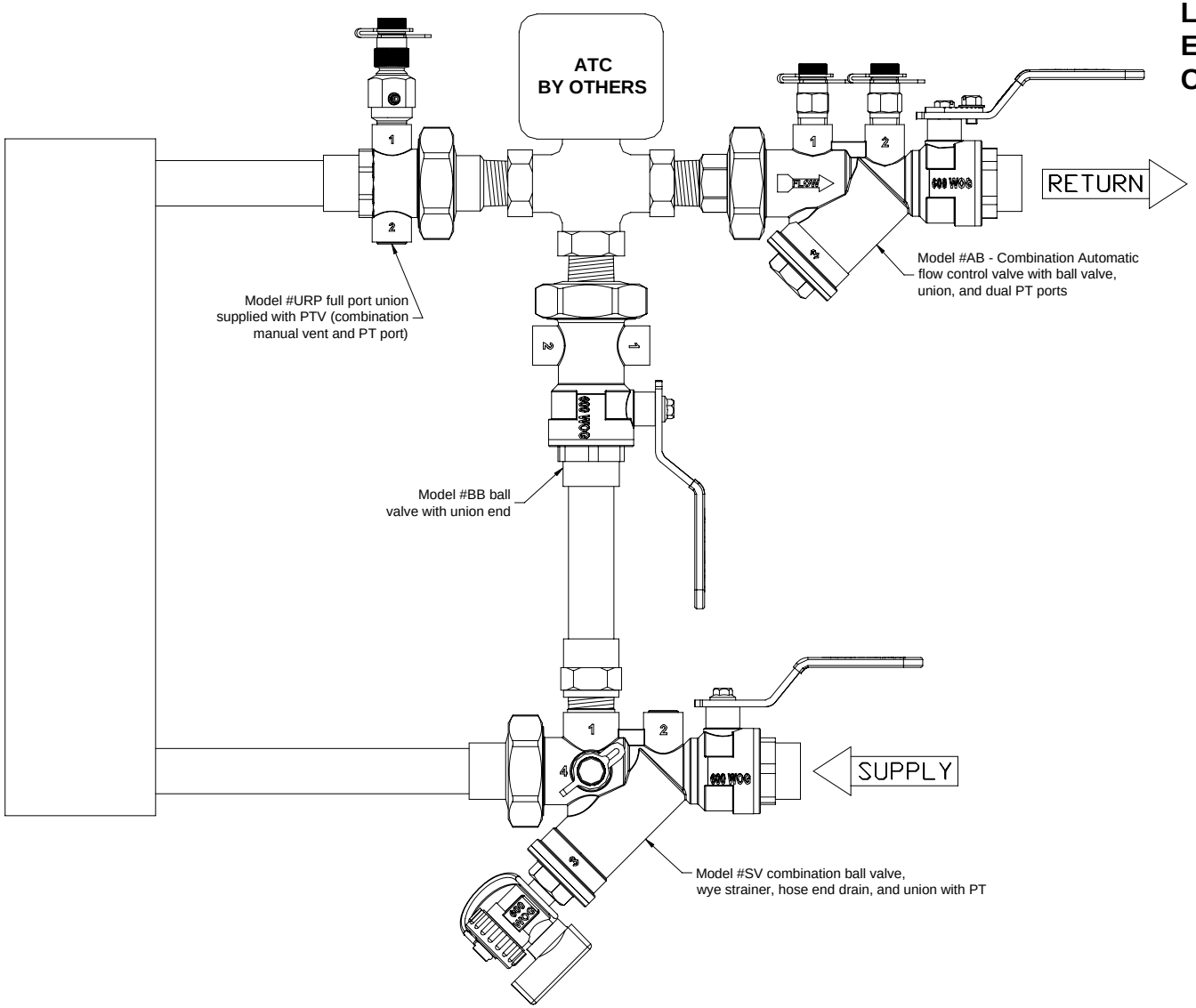
Valve Package (Model # 3RS-AB)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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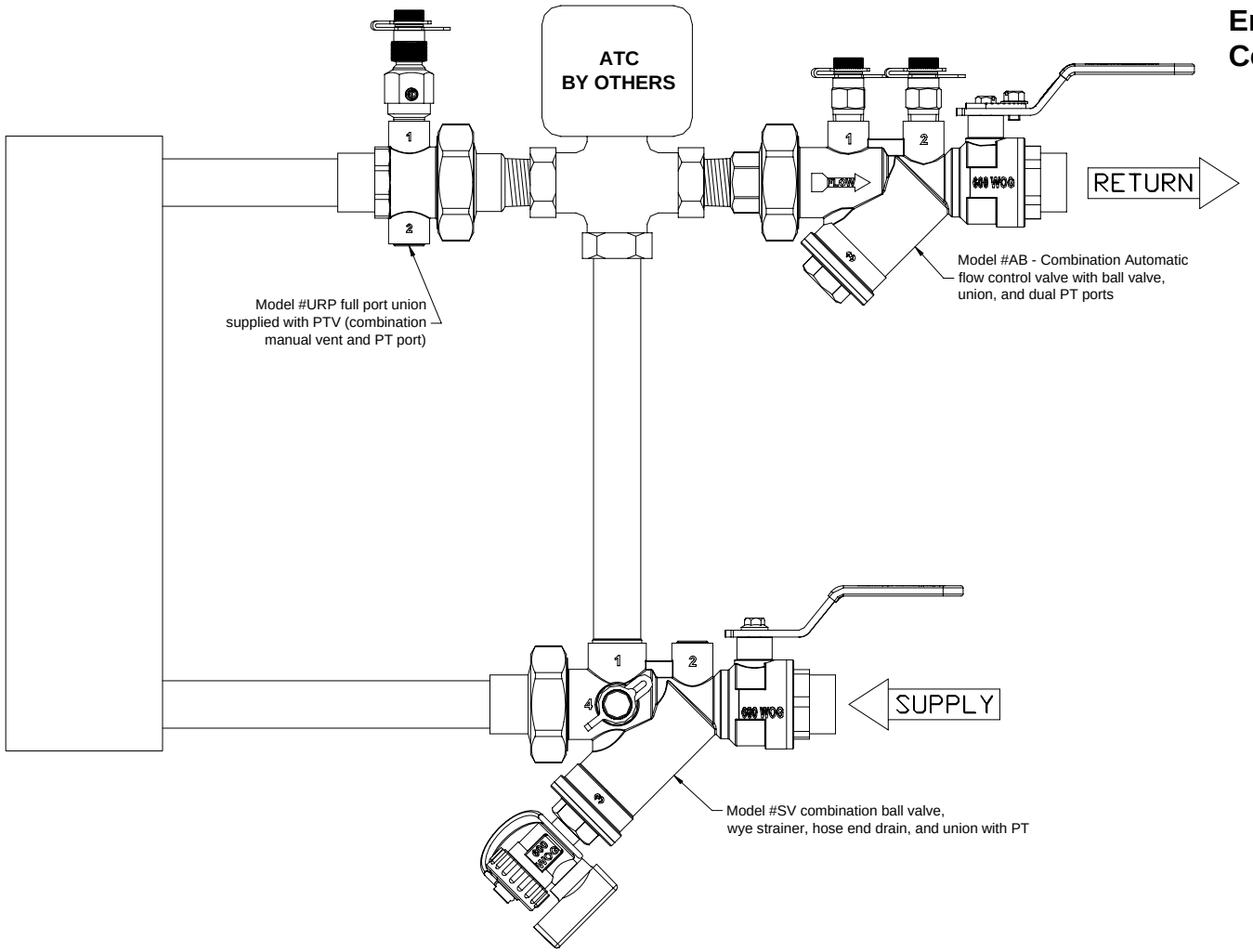
Valve Package (Model # 3RS-AB2)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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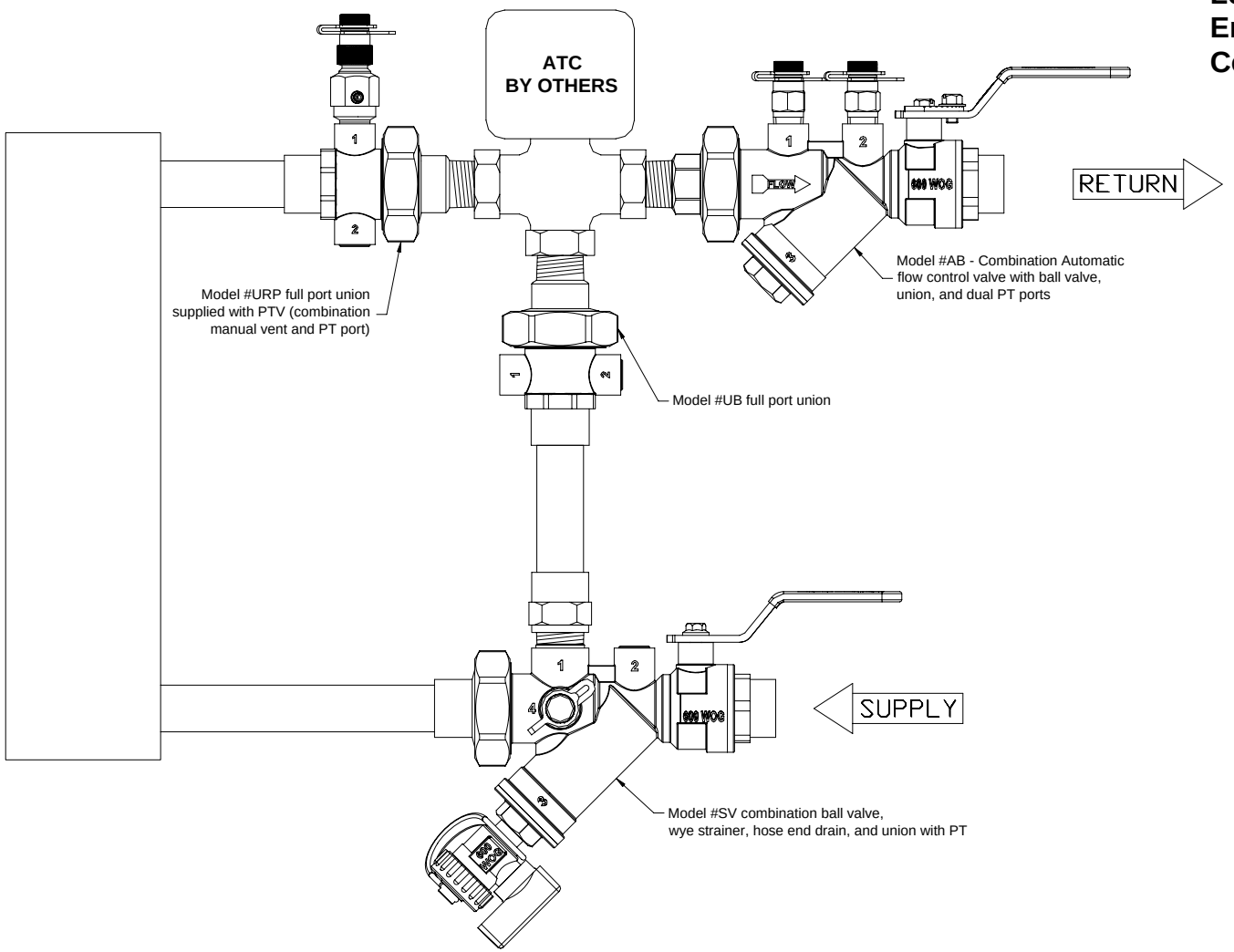
Valve Package (Model # 3RS-ABX)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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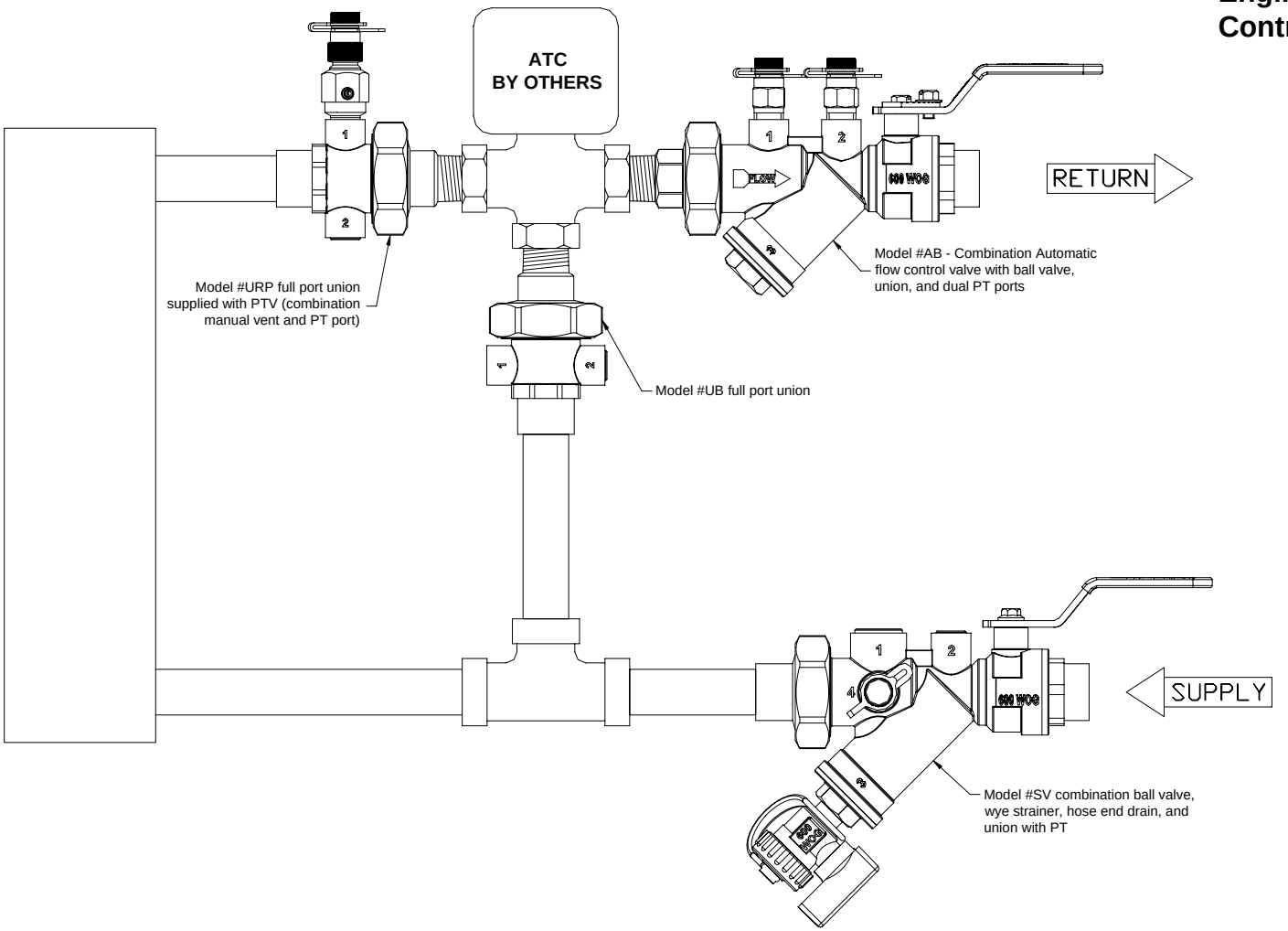
Valve Package (Model # 3RS-ABX)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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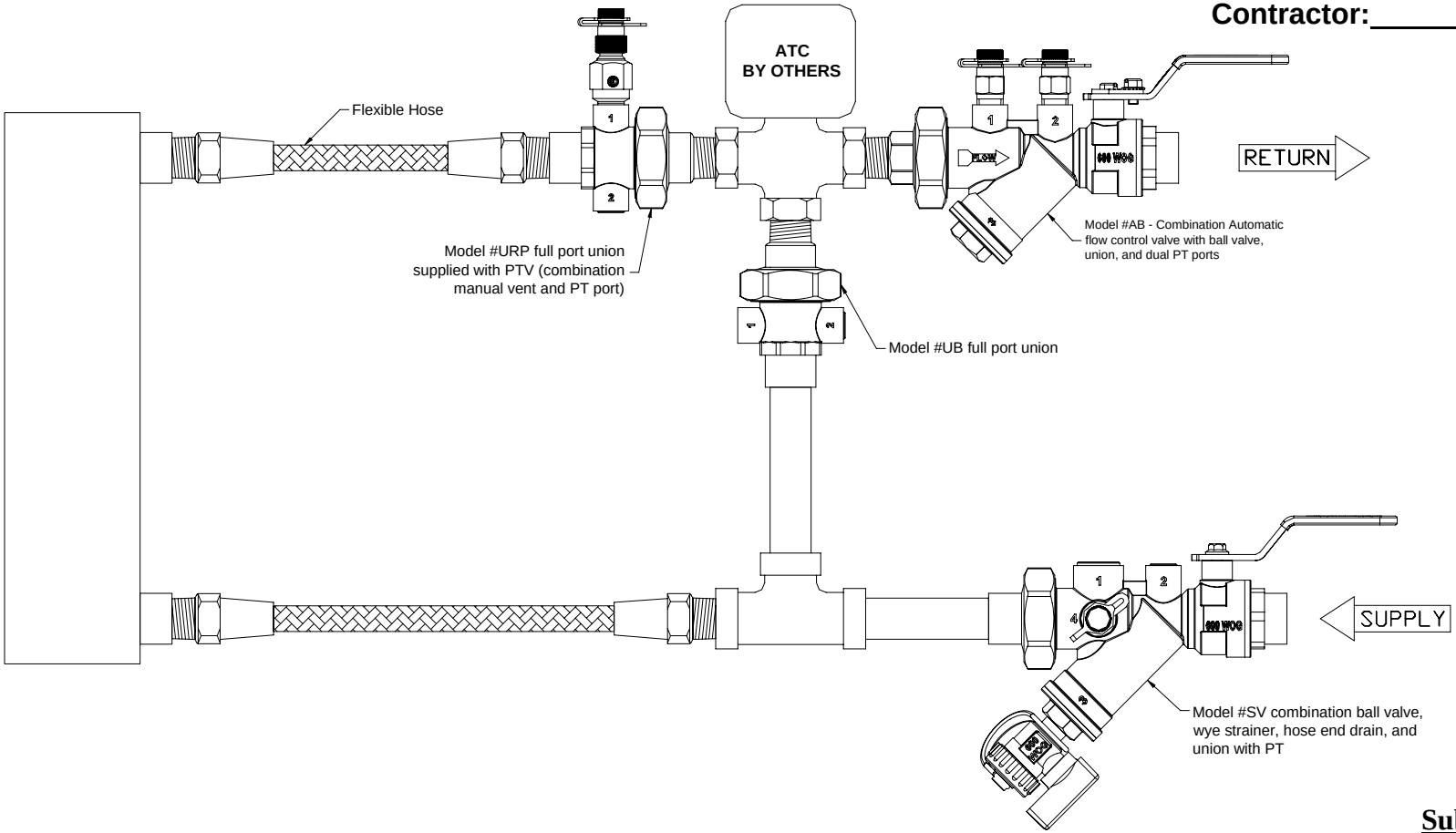
Valve Package (Model # 3RS-ABX-FLEX)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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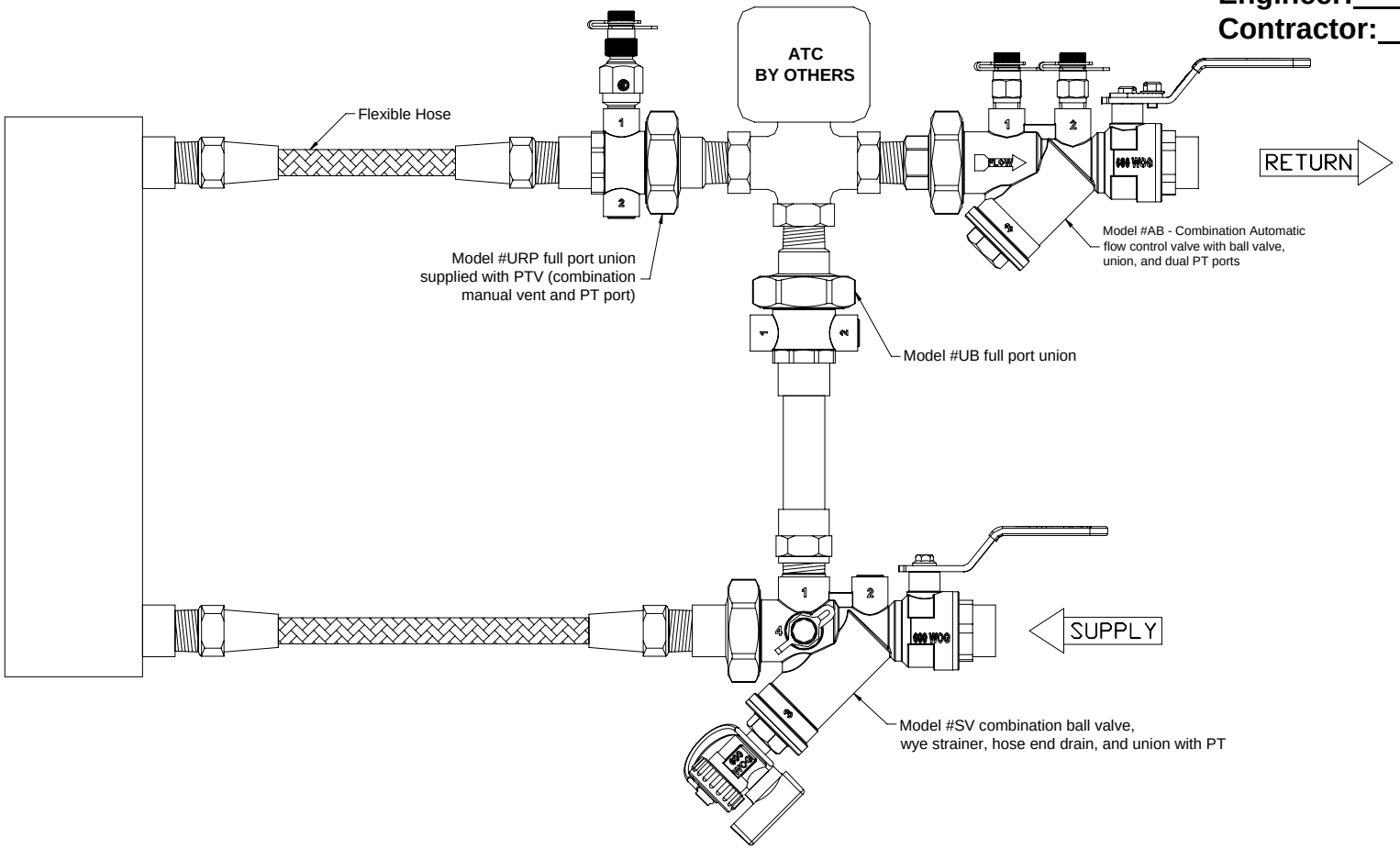
Valve Package (Model # 3RS-ABX-FLEX)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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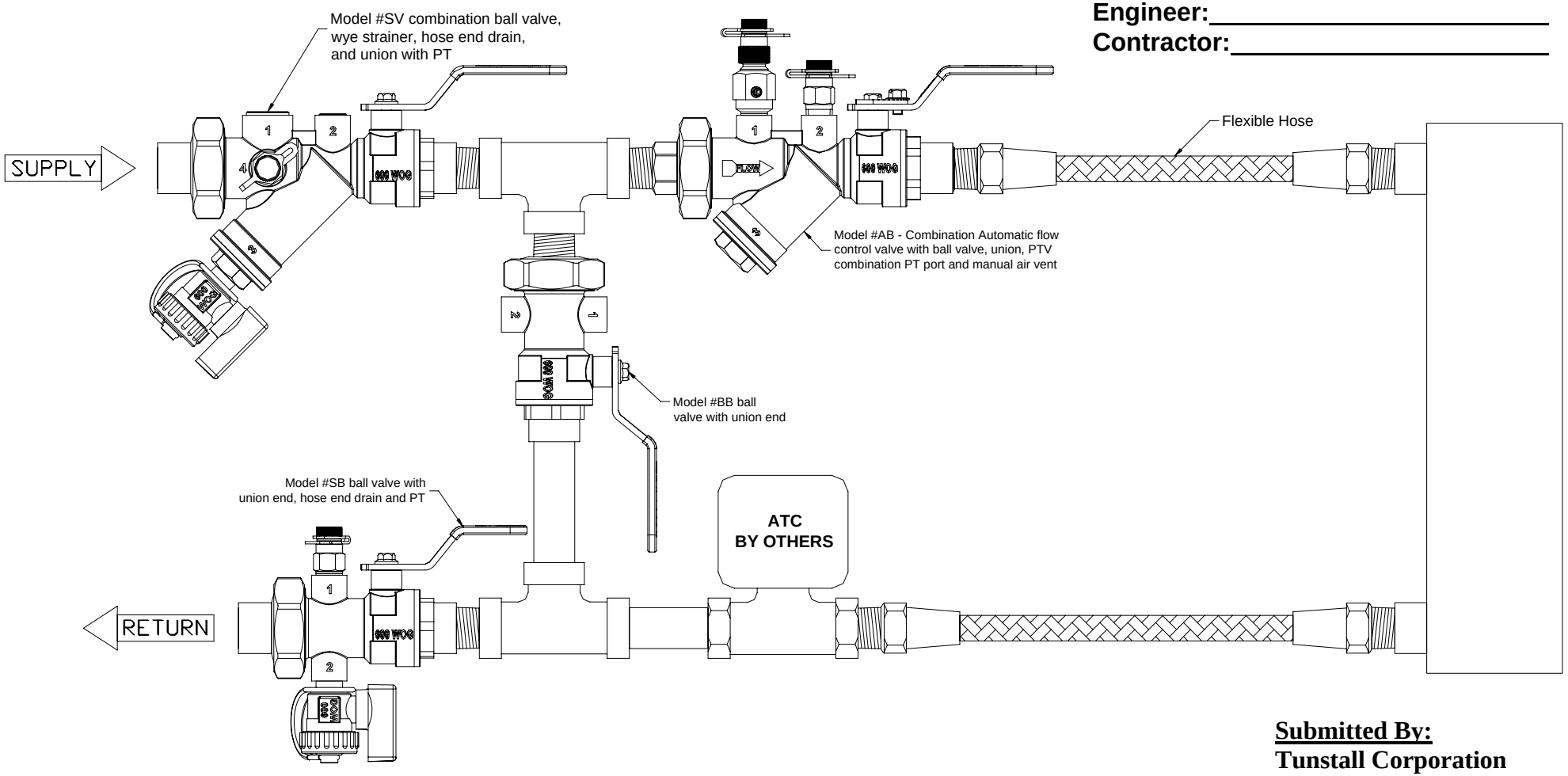
Valve Package (Model # 3RSX-ABX-FLEX)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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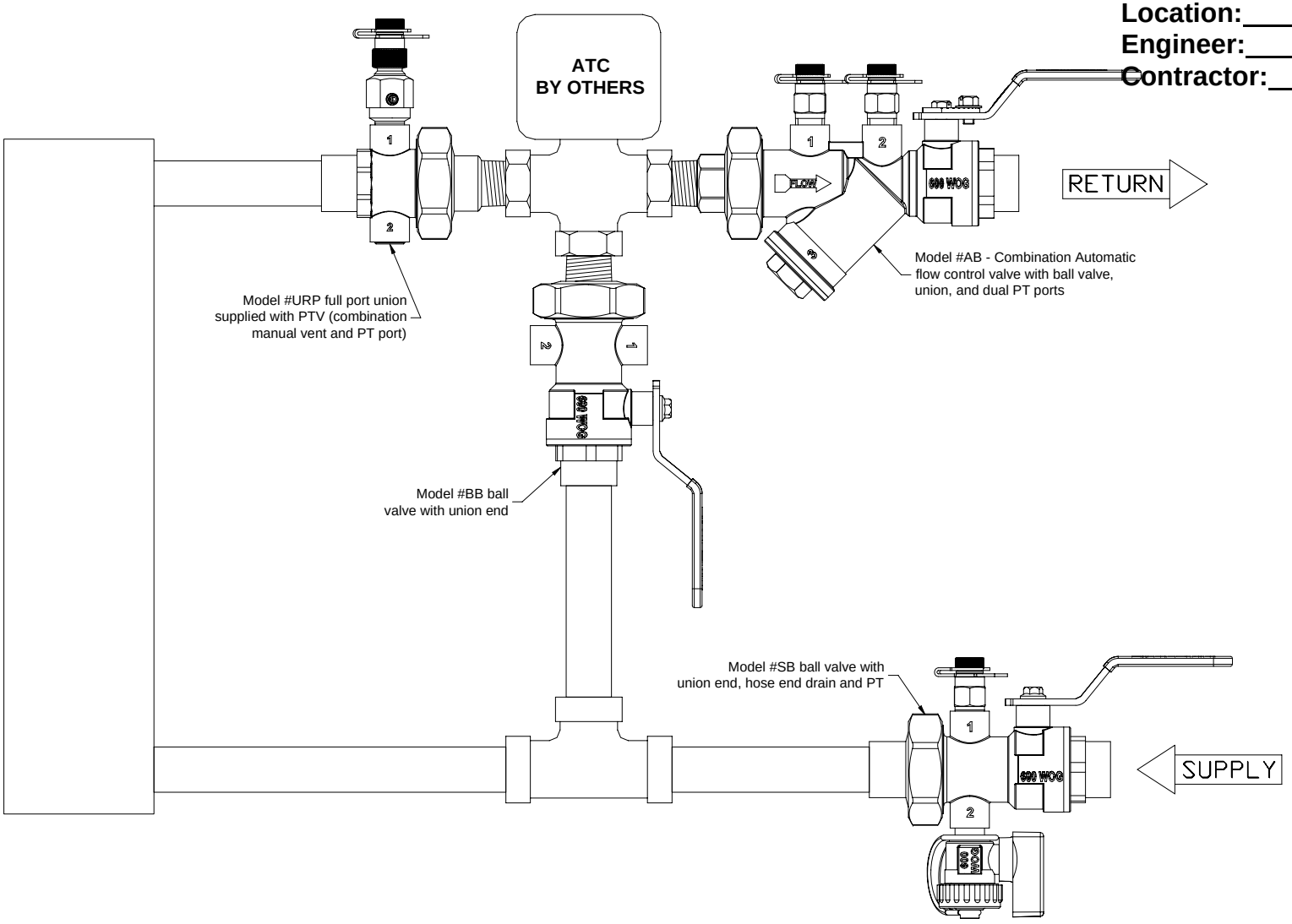
Valve Package (Model # 3RB-AB)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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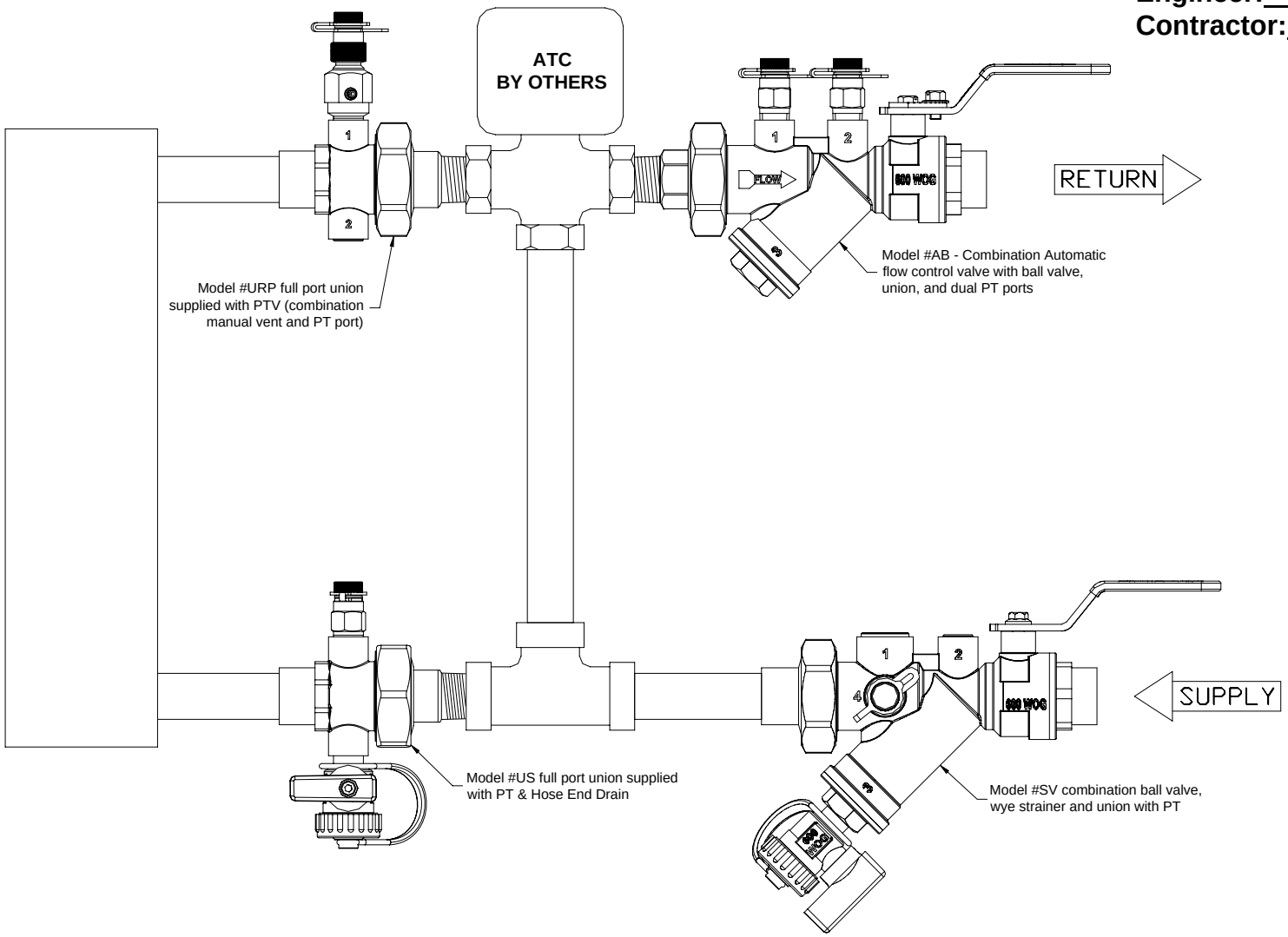
Valve Package (Model # 3RU-AB)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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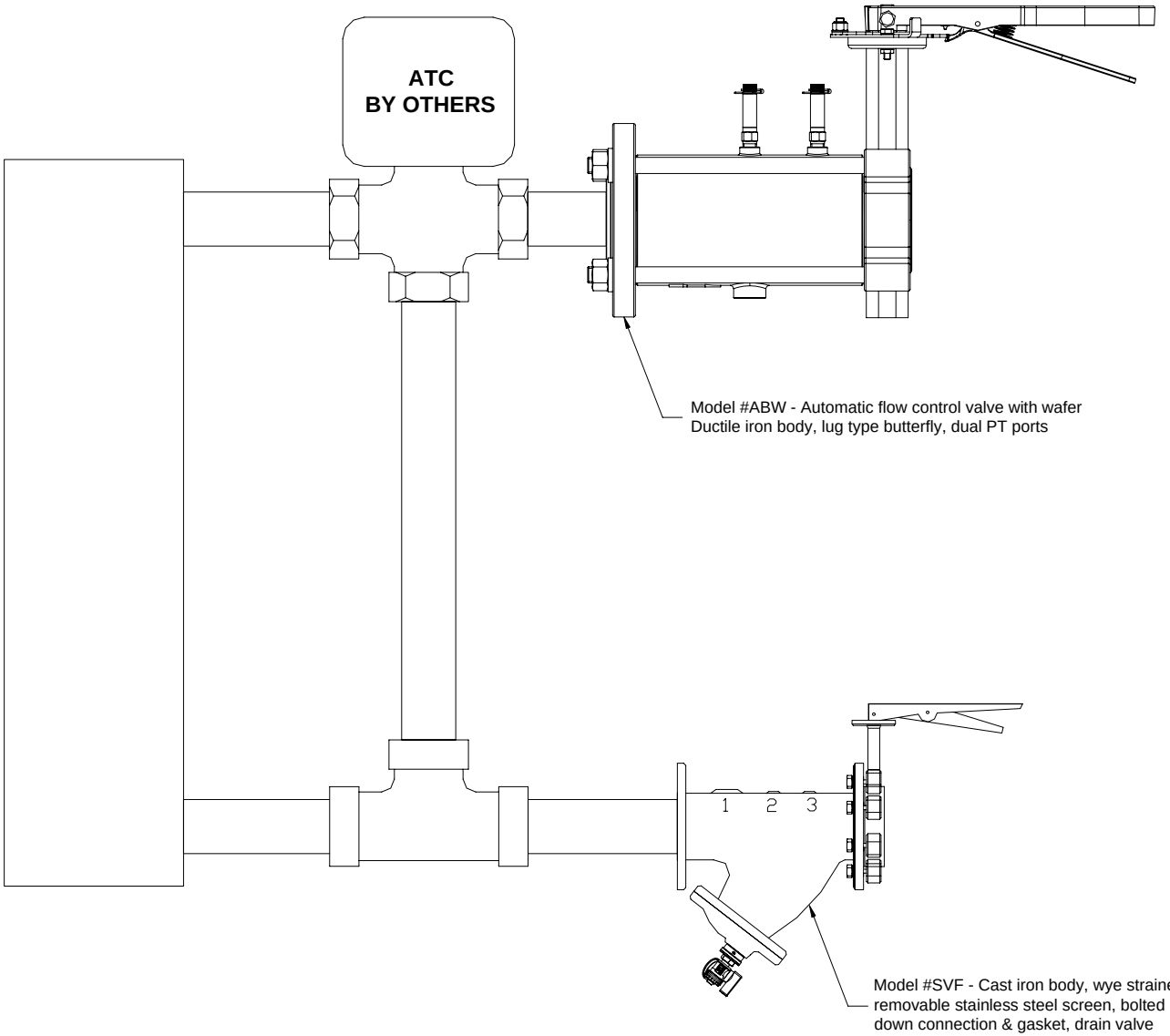
Valve Package (Model # 3SW-AB)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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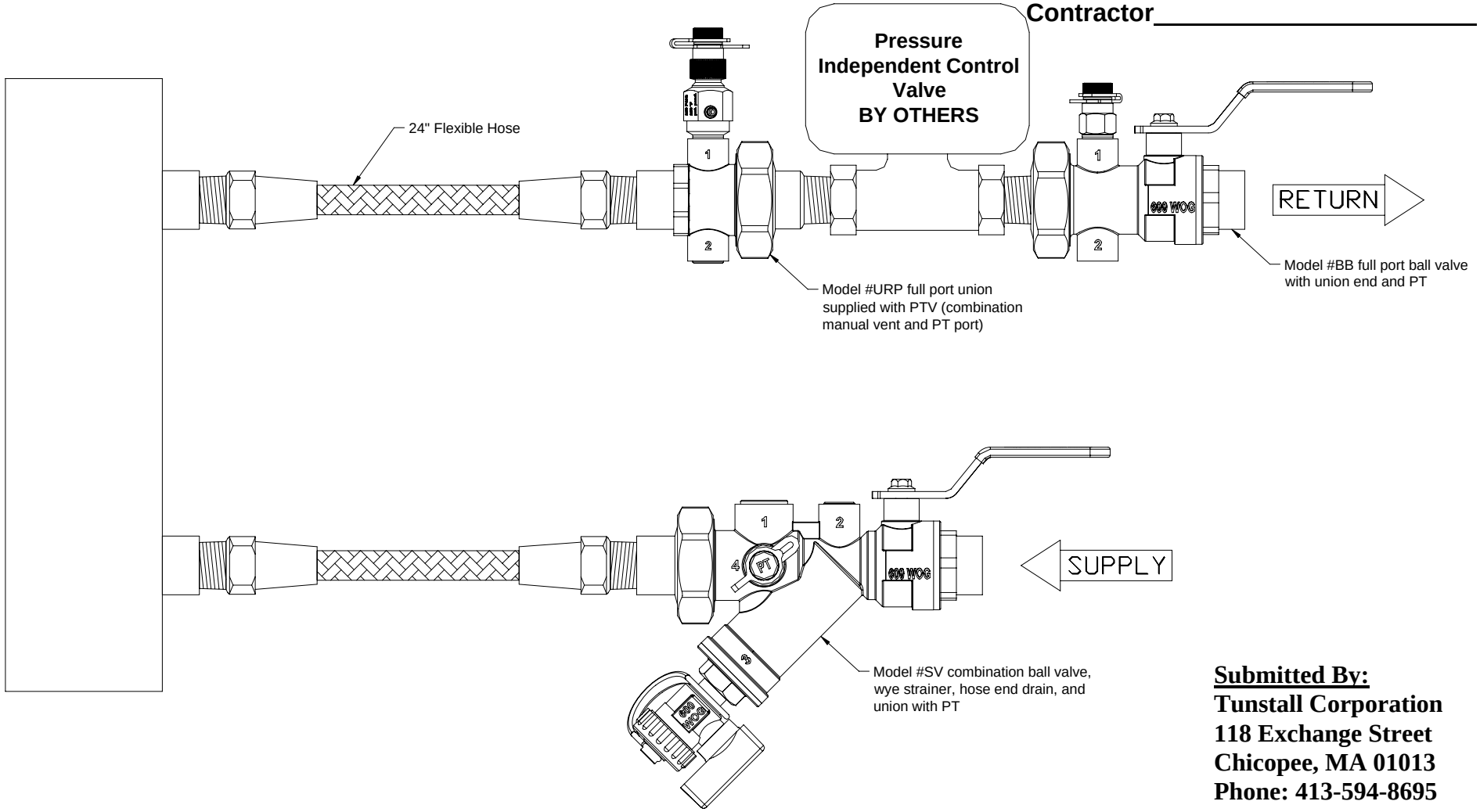
Valve Package (Model # 2RS-BB-FLEX)

Job Name:_____
Location:_____
Engineer:_____
Contractor_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

MACON® BALANCING
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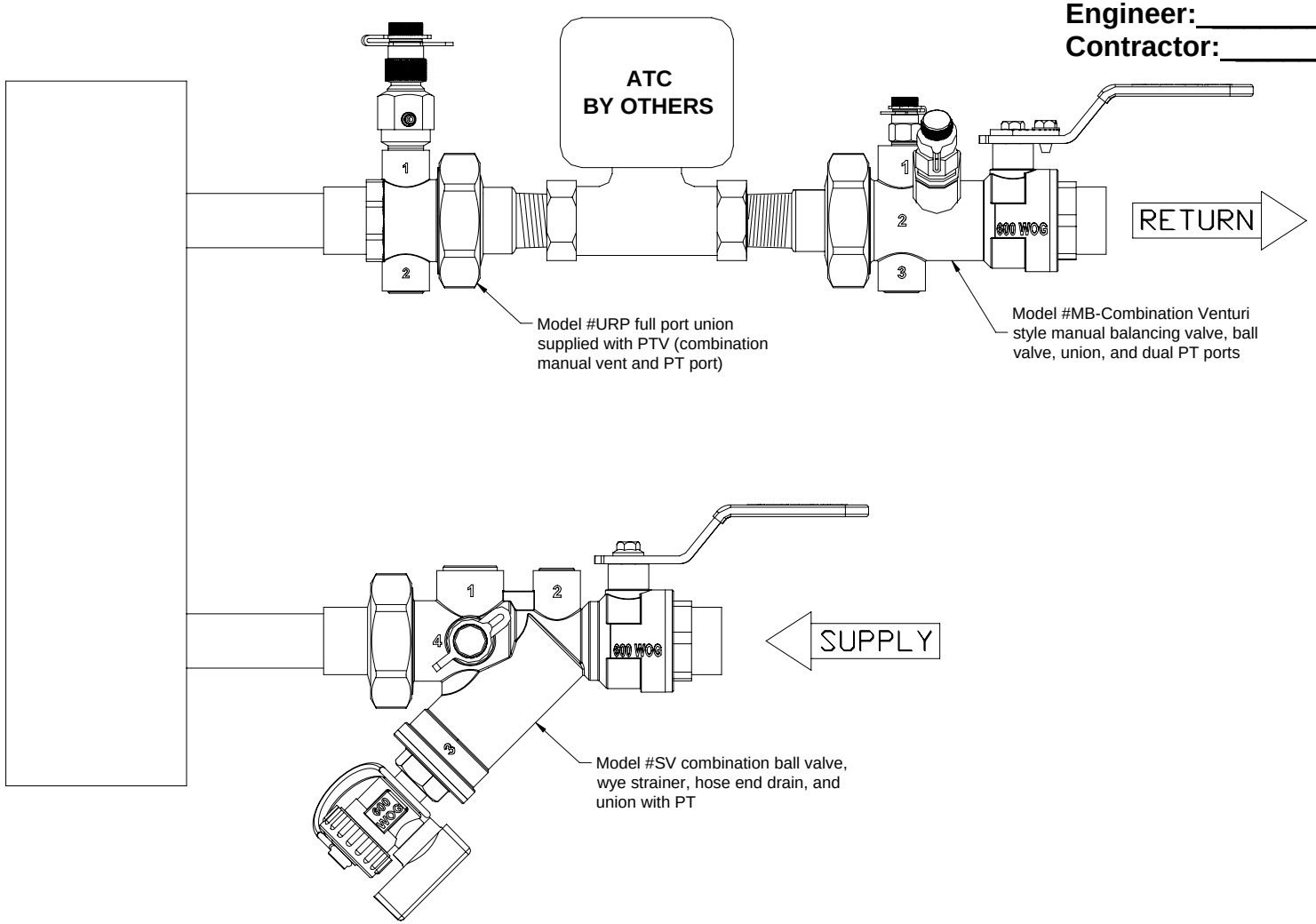
Valve Package (Model # 2RS-MV)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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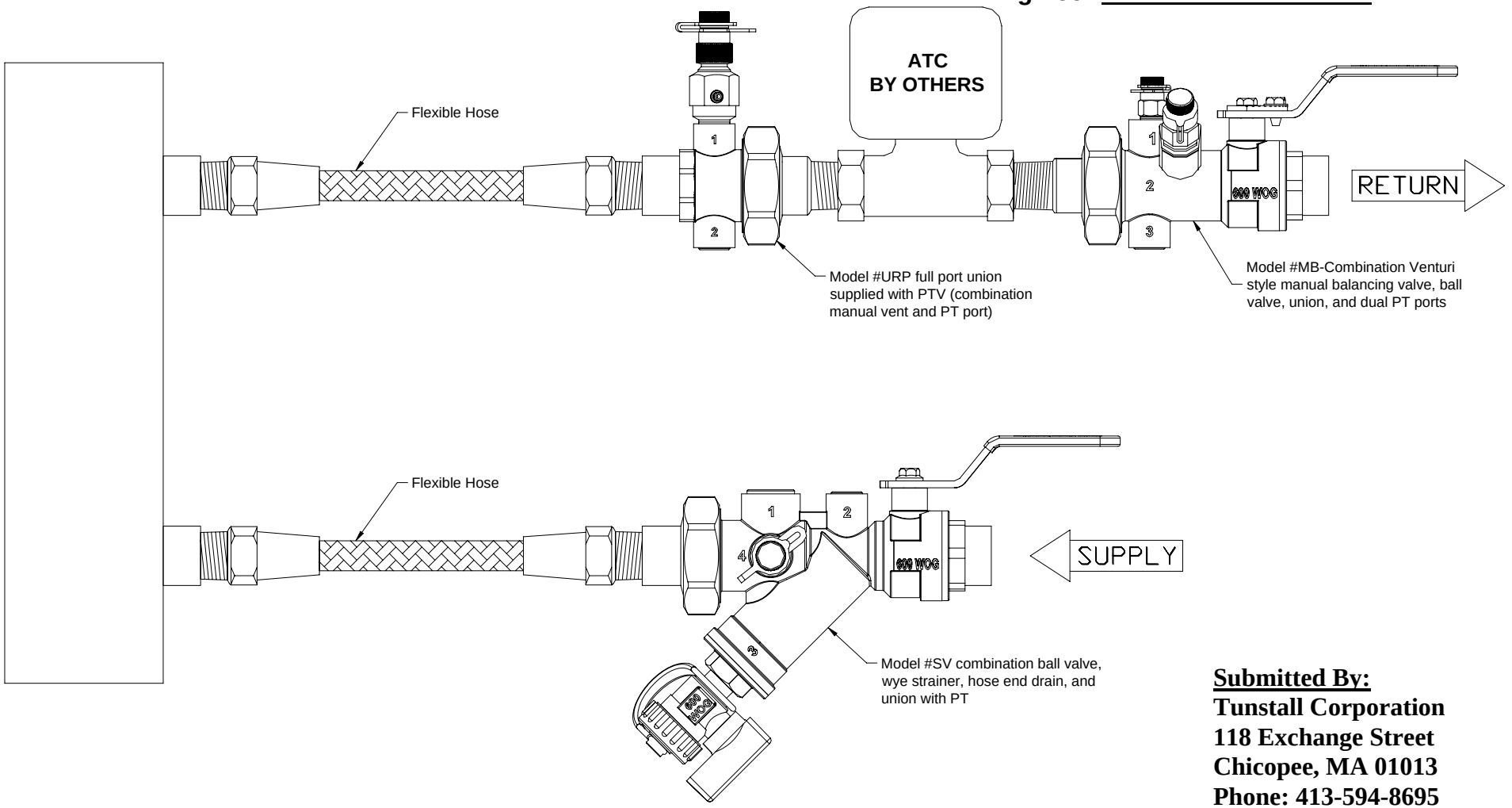
Valve Package (Model # 2RS-MV-FLEX)

Job Name:_____
Location: _____
Engineer:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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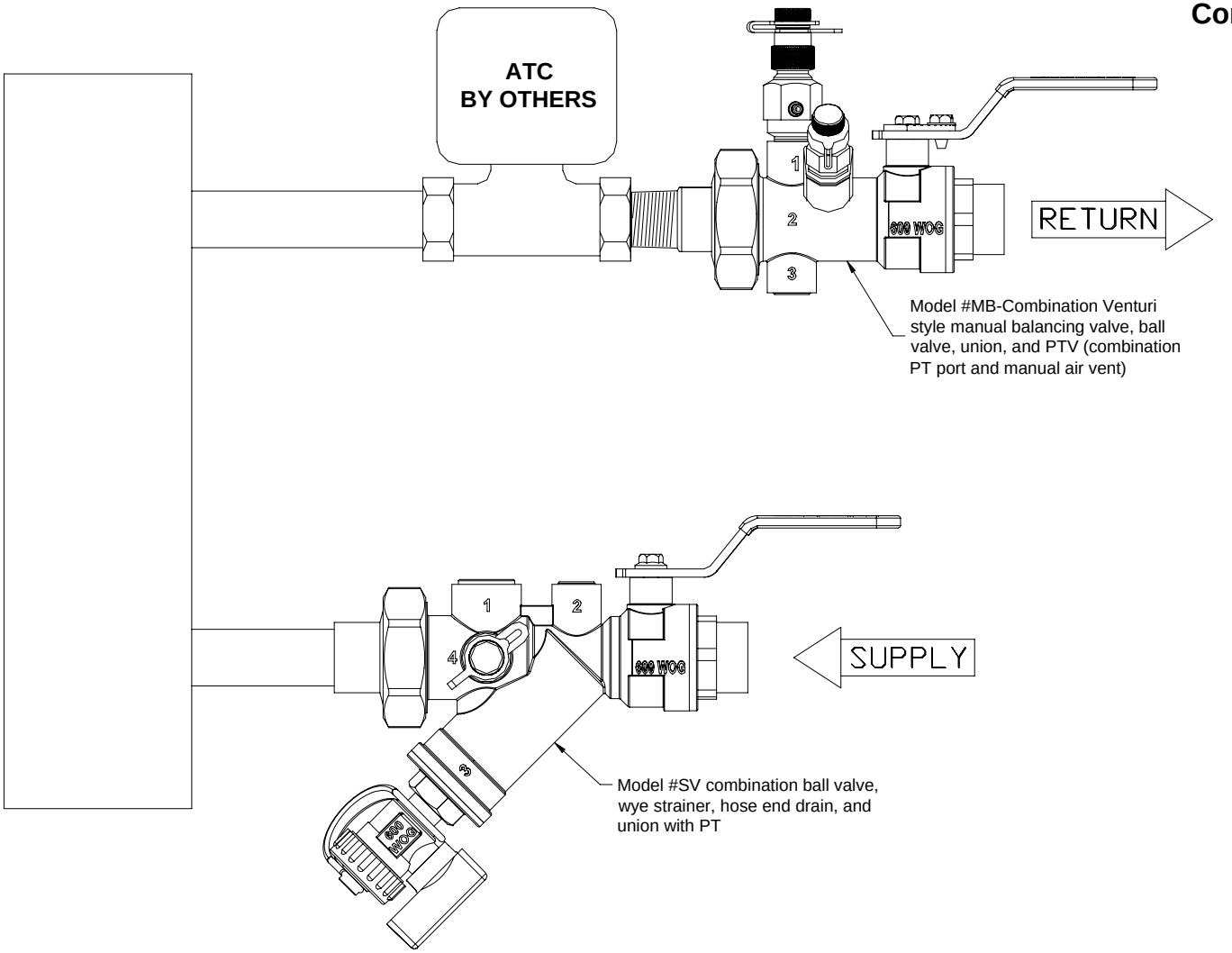
Valve Package (Model # 2RS-MV-X)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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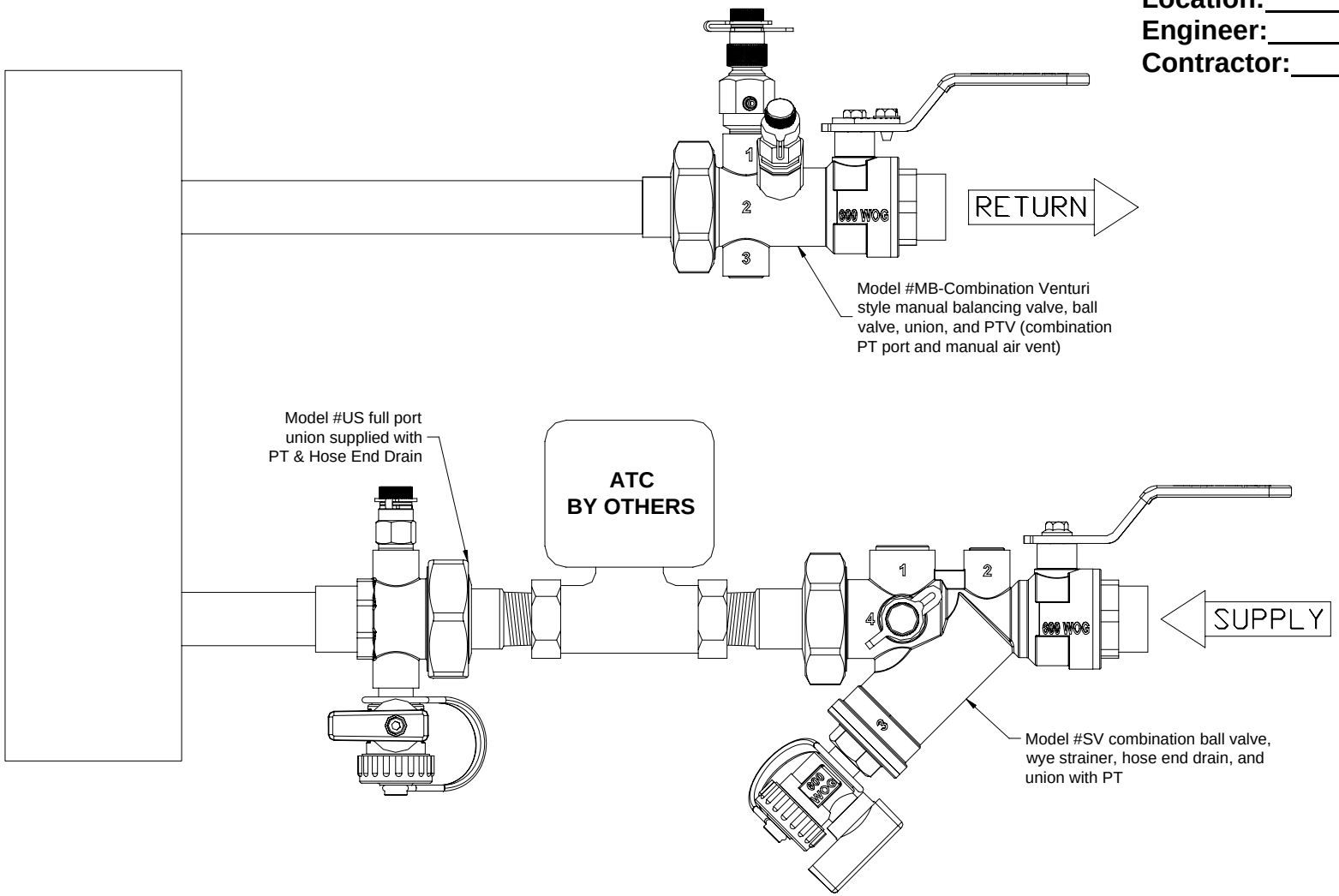
Valve Package (Model # 2SS-MV)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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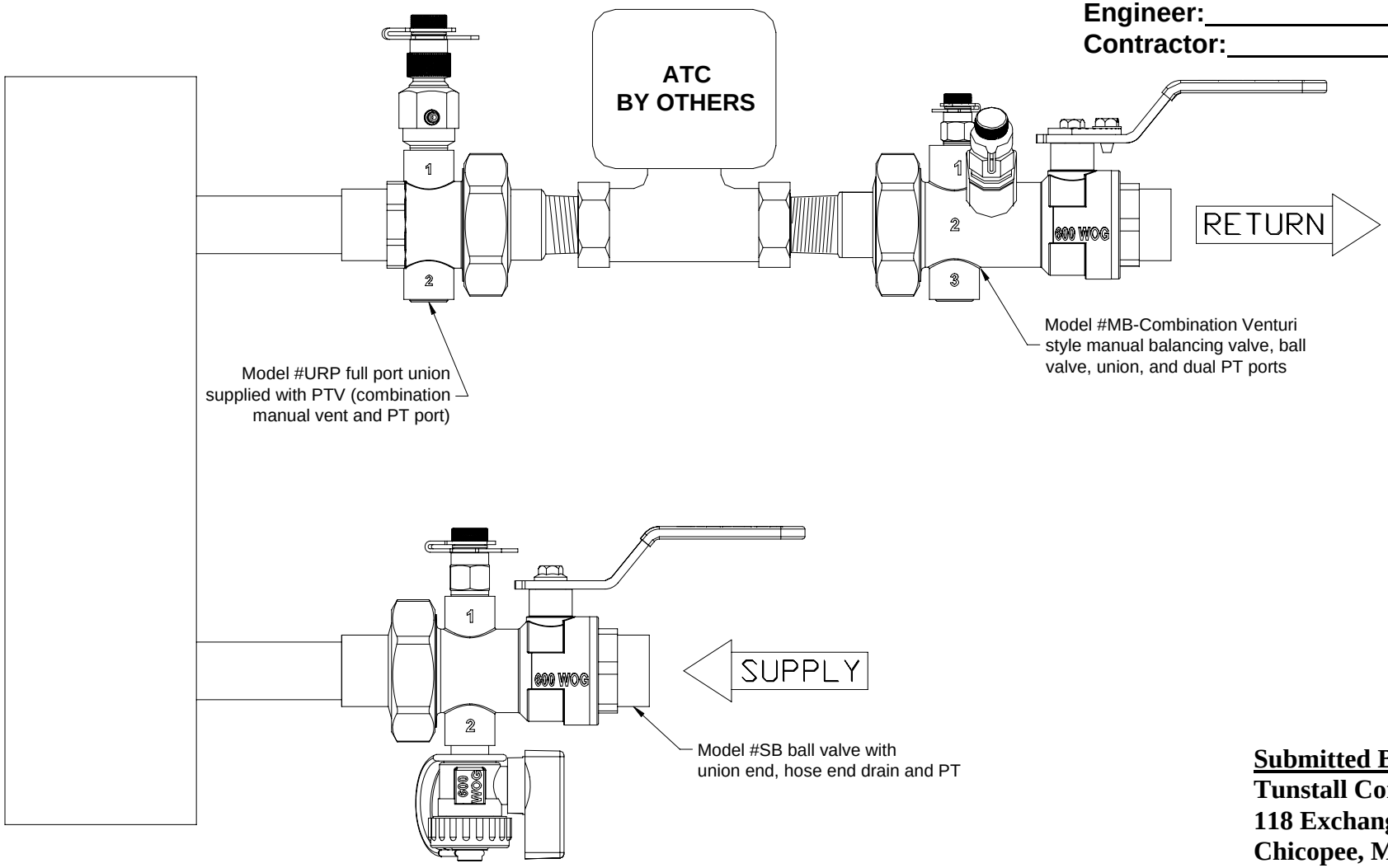
Valve Package (Model # 2RB-MV)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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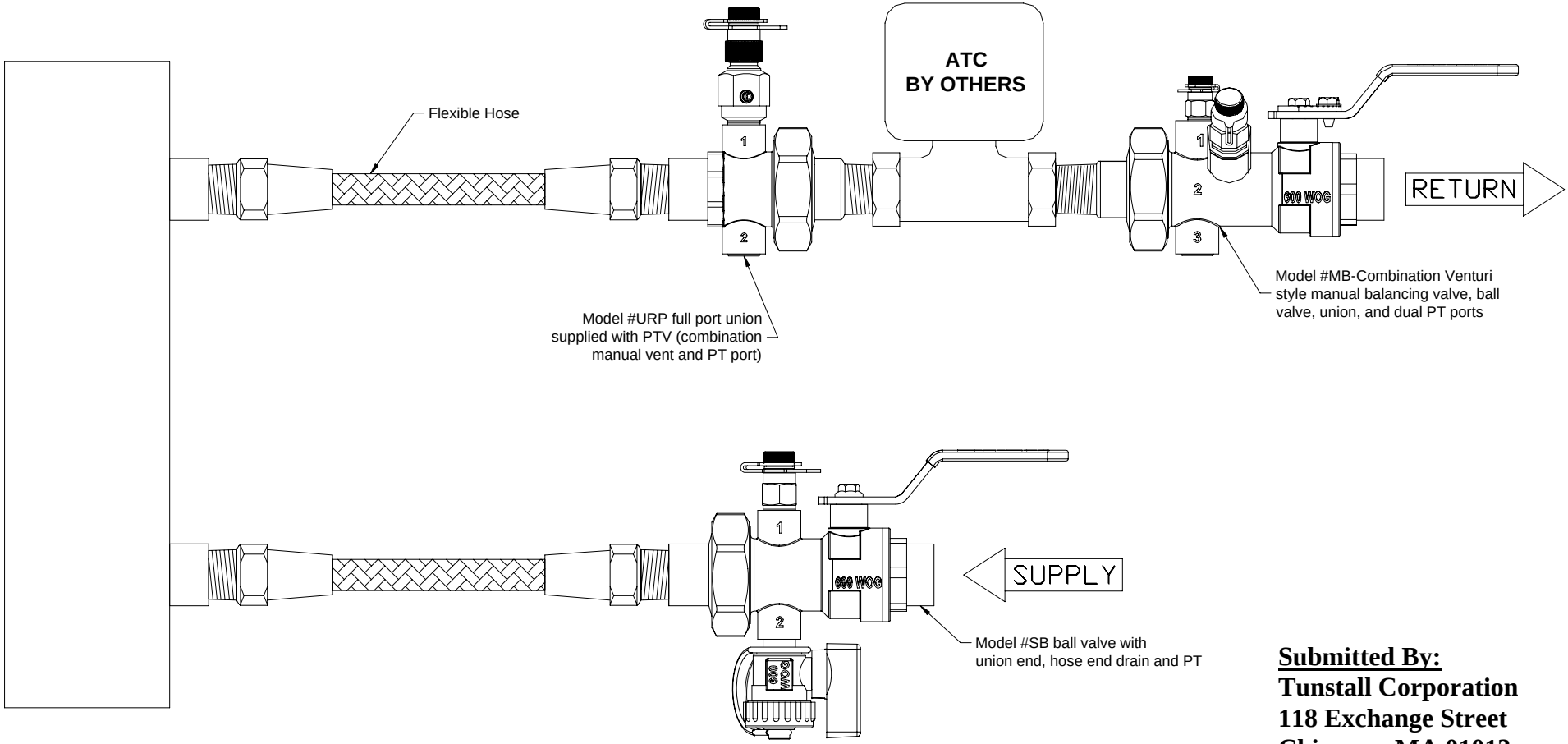
Valve Package (Model # 2RB-MV-FLEX)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
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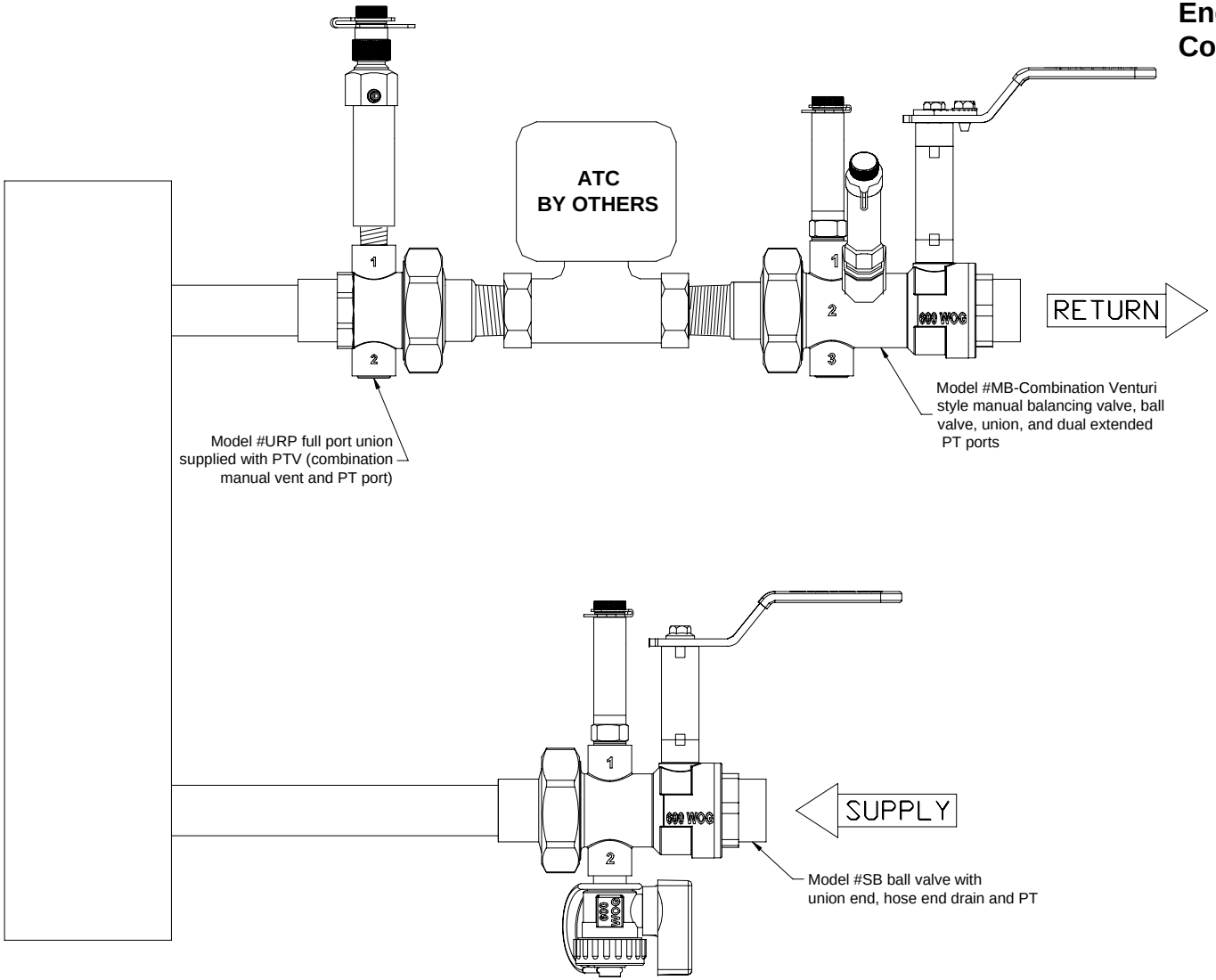
Valve Package (Model # 2RB-MV-EXT)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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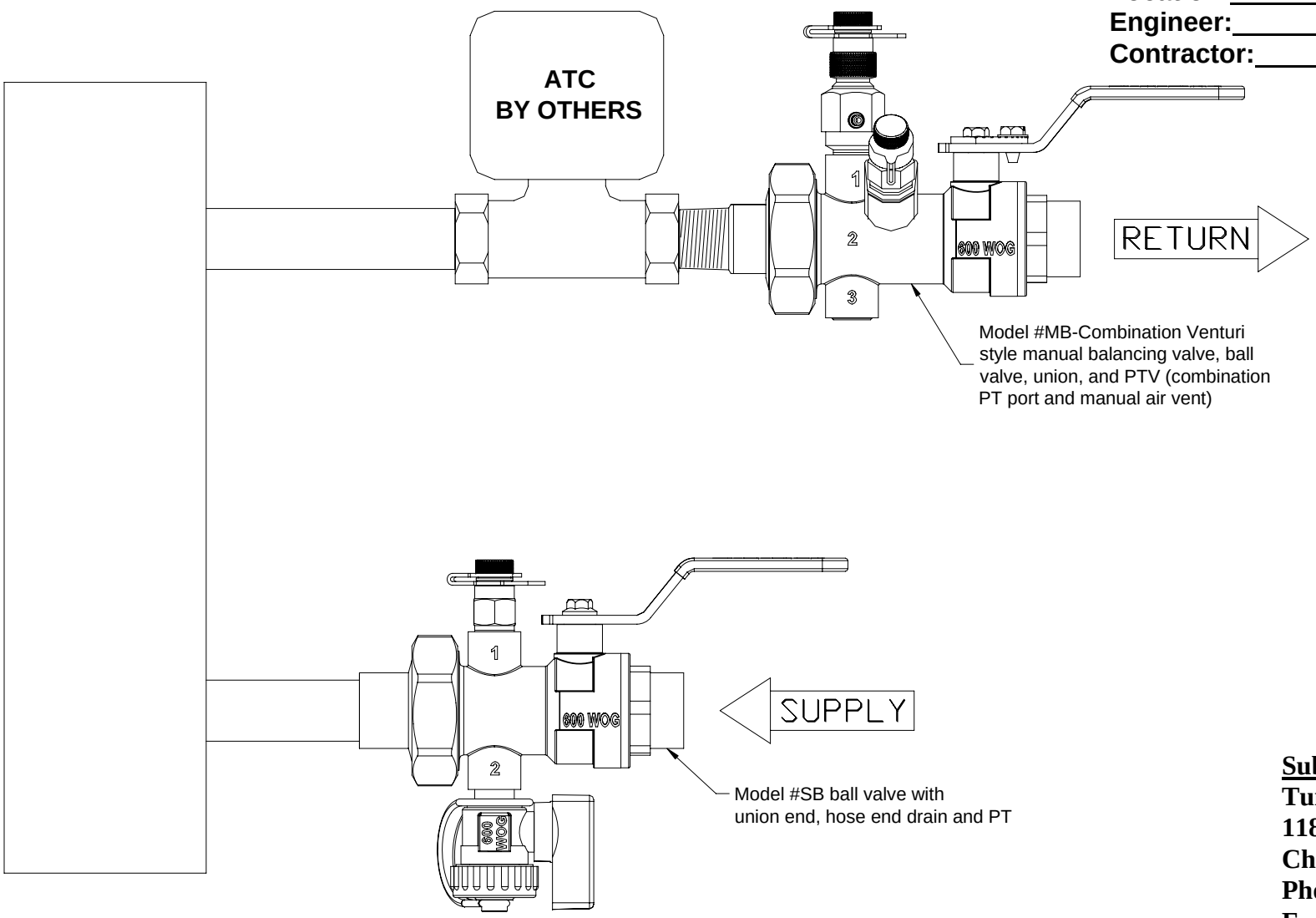
Valve Package (Model # 2RB-MV-X)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



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Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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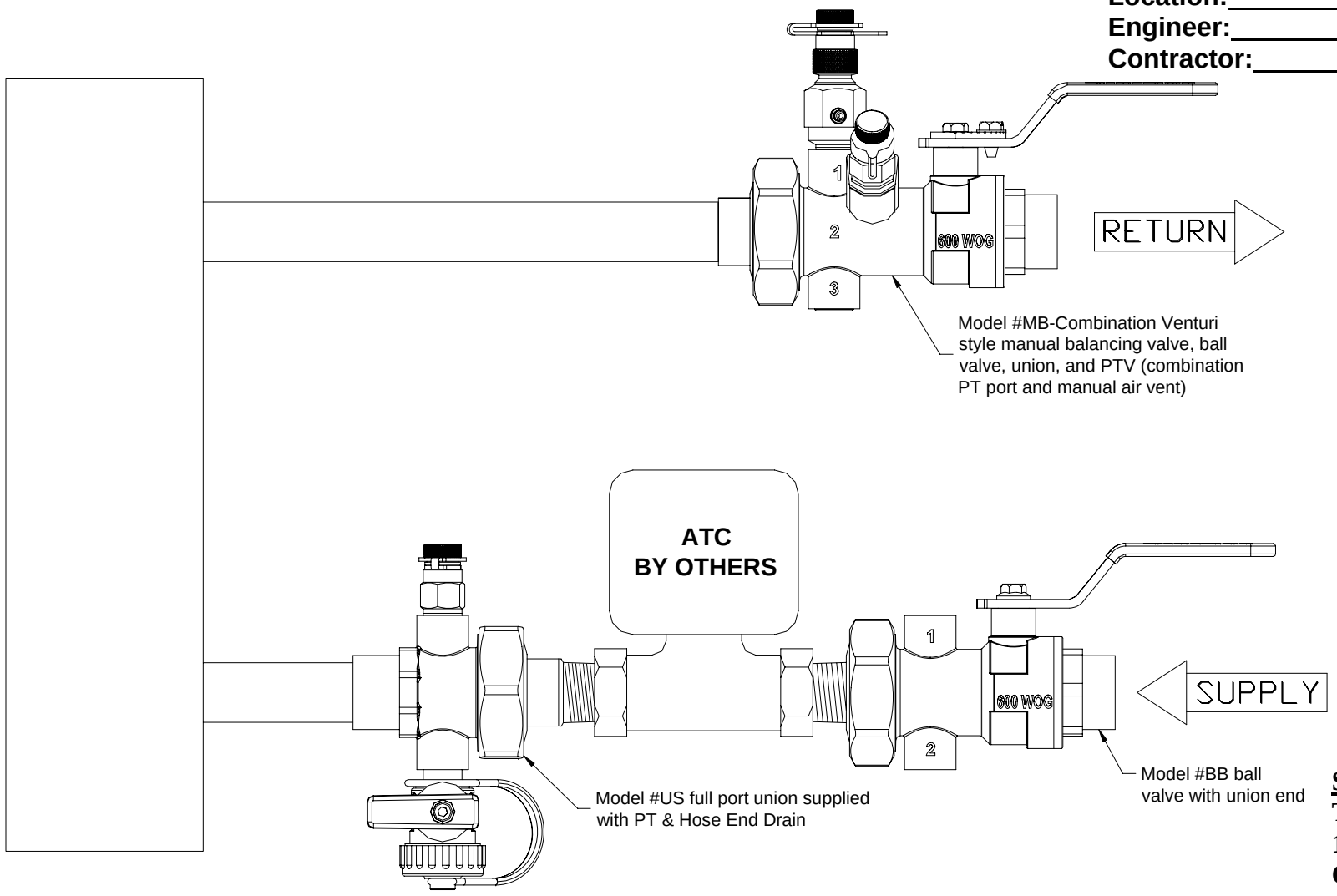
Valve Package (Model # 2SB-MV)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
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Phone: 413-594-8695
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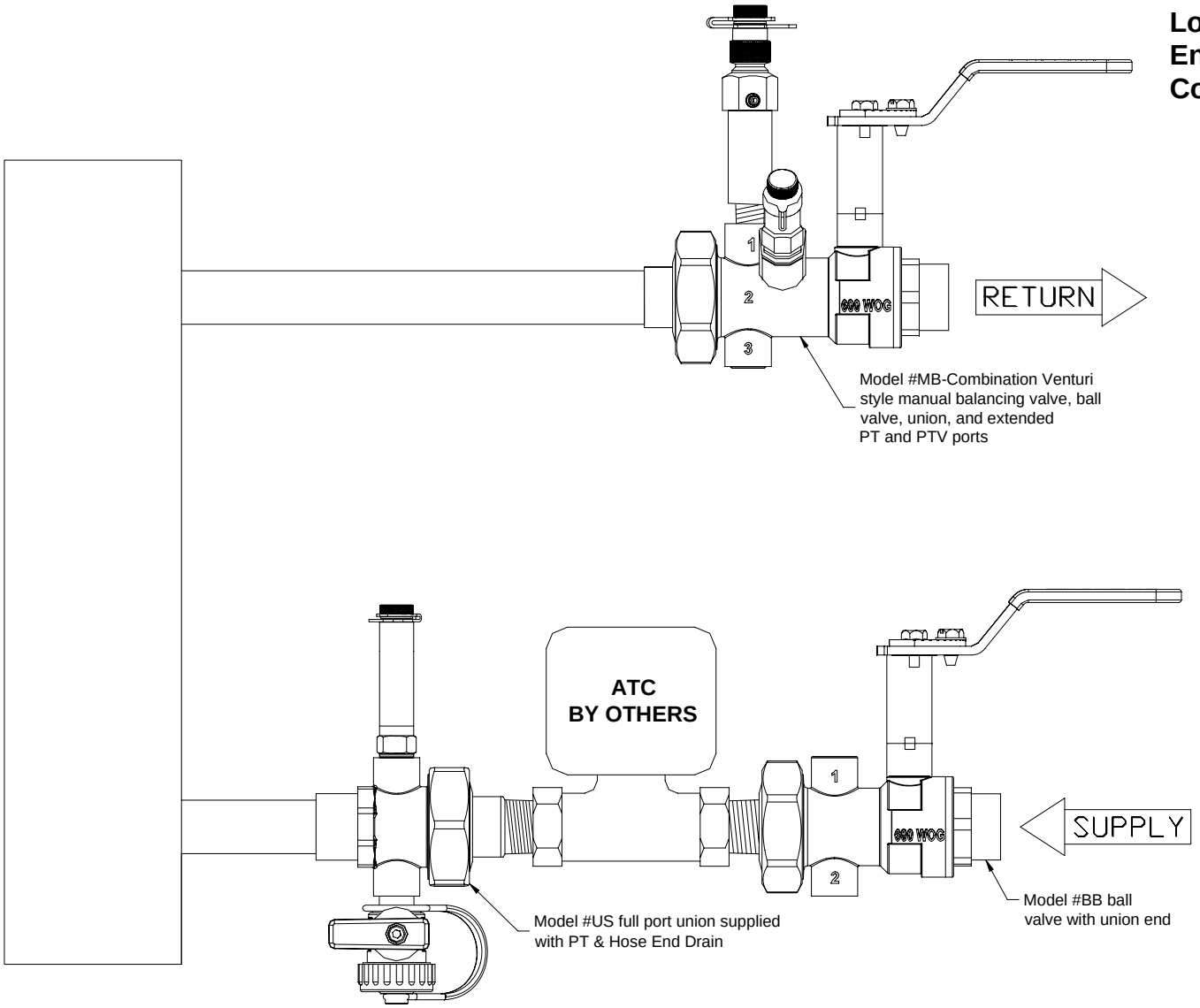
Valve Package (Model # 2SB-MV-EXT)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____

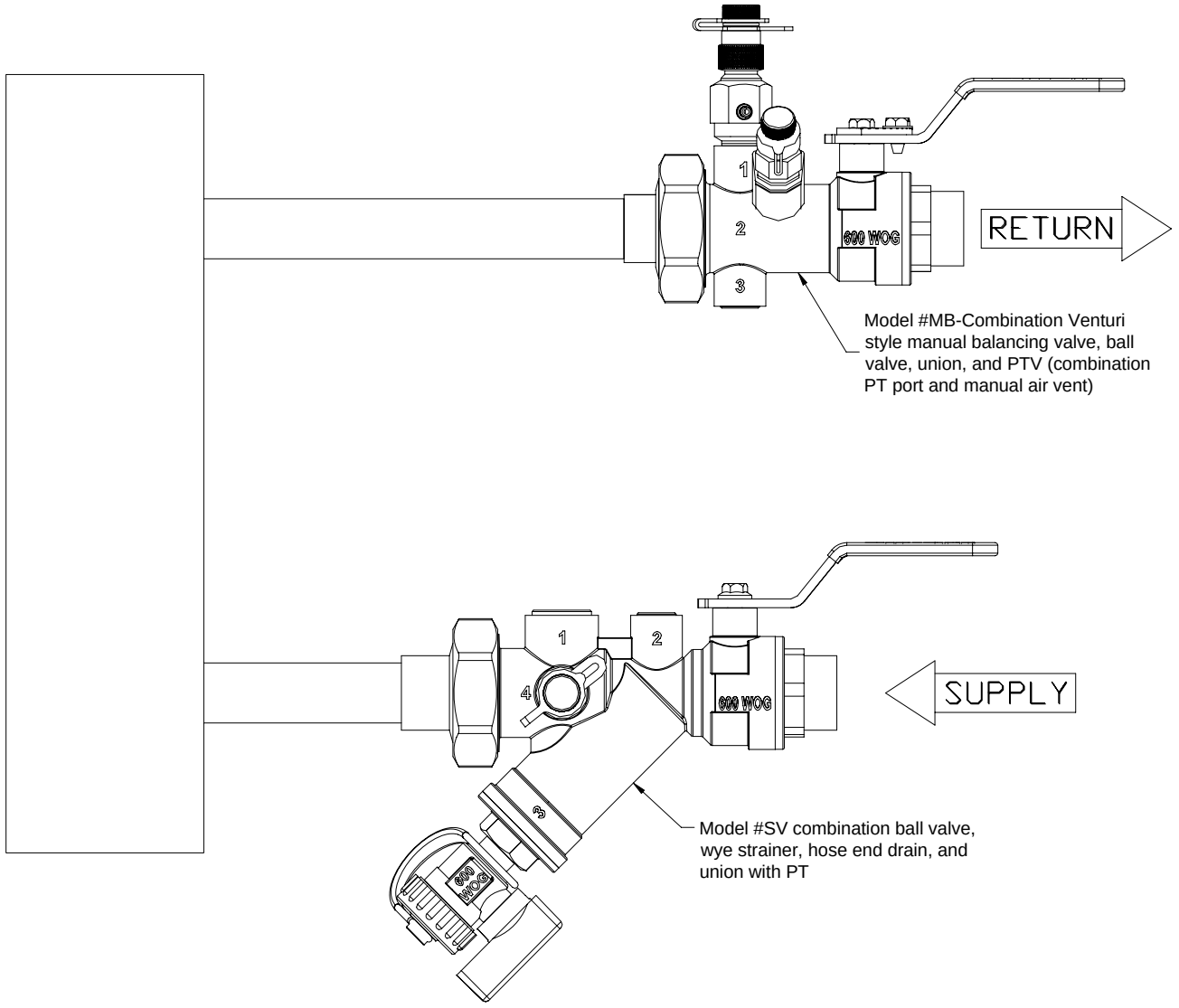


Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

MACON® BALANCING
www.maconbalancing.com

Valve Package (Model # XXS-MV)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

MACON® BALANCING
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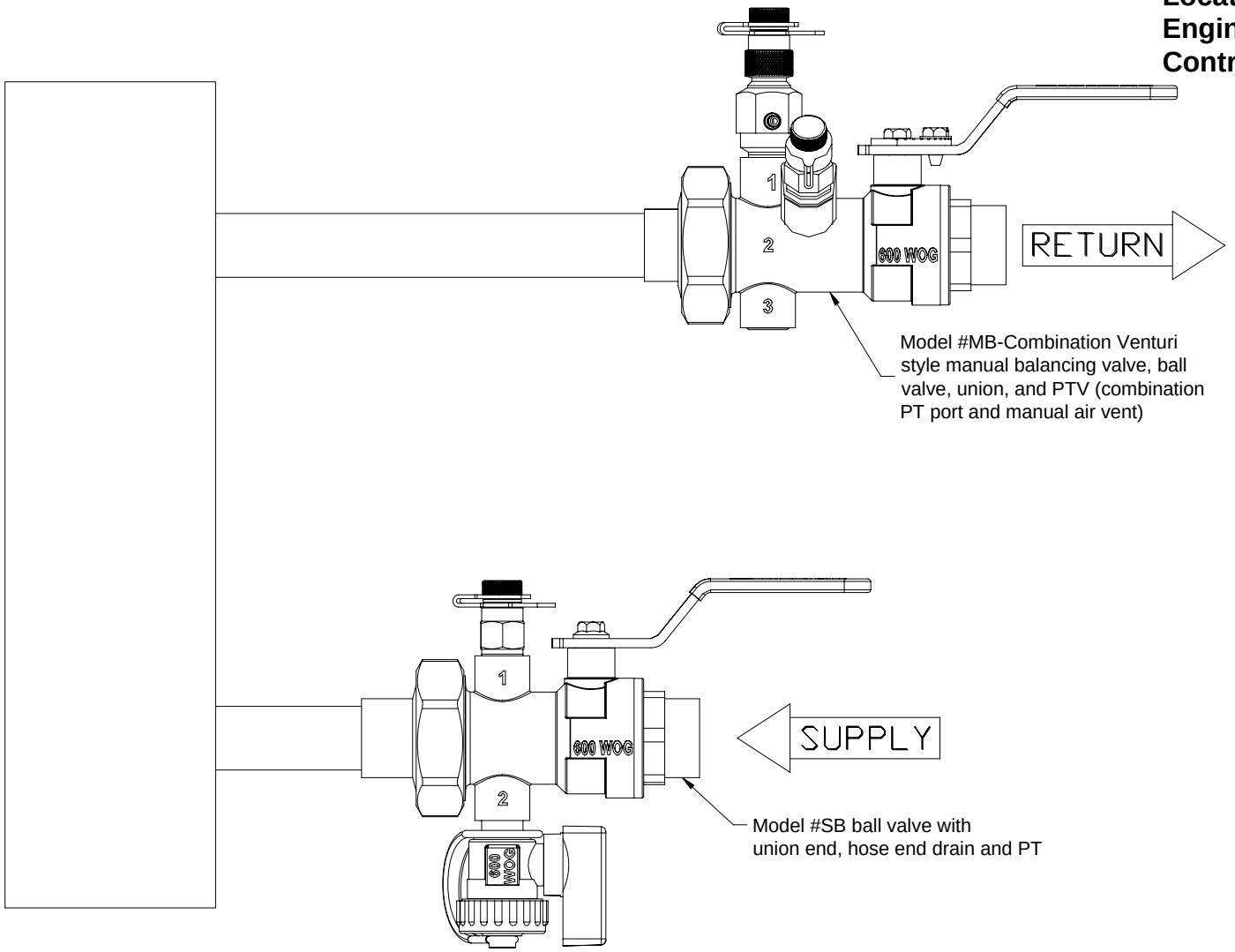
Valve Package (Model # XXB-MV)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

MACON® BALANCING
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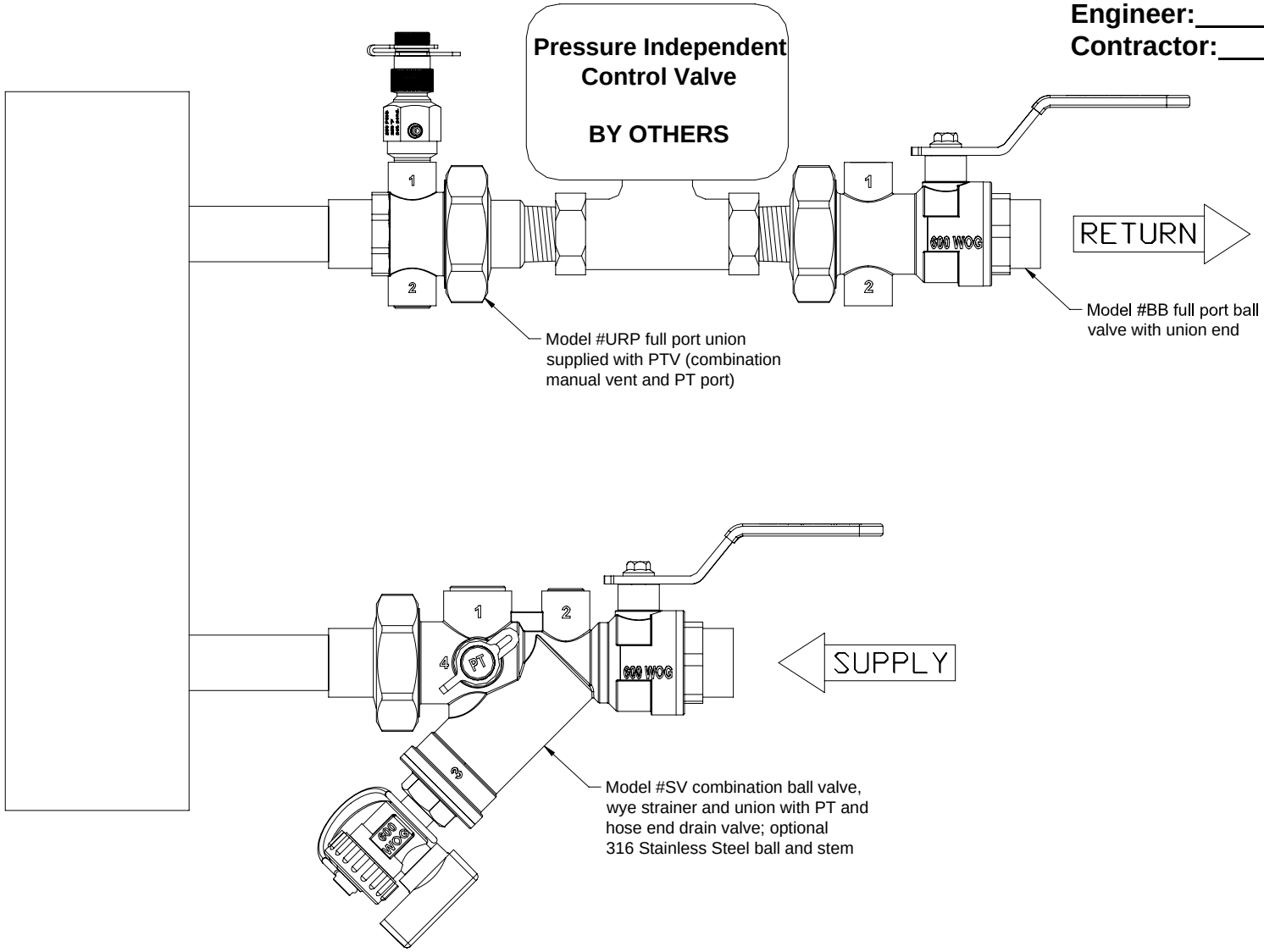
Valve Package (Model # 2RS-BB)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

MACON® BALANCING
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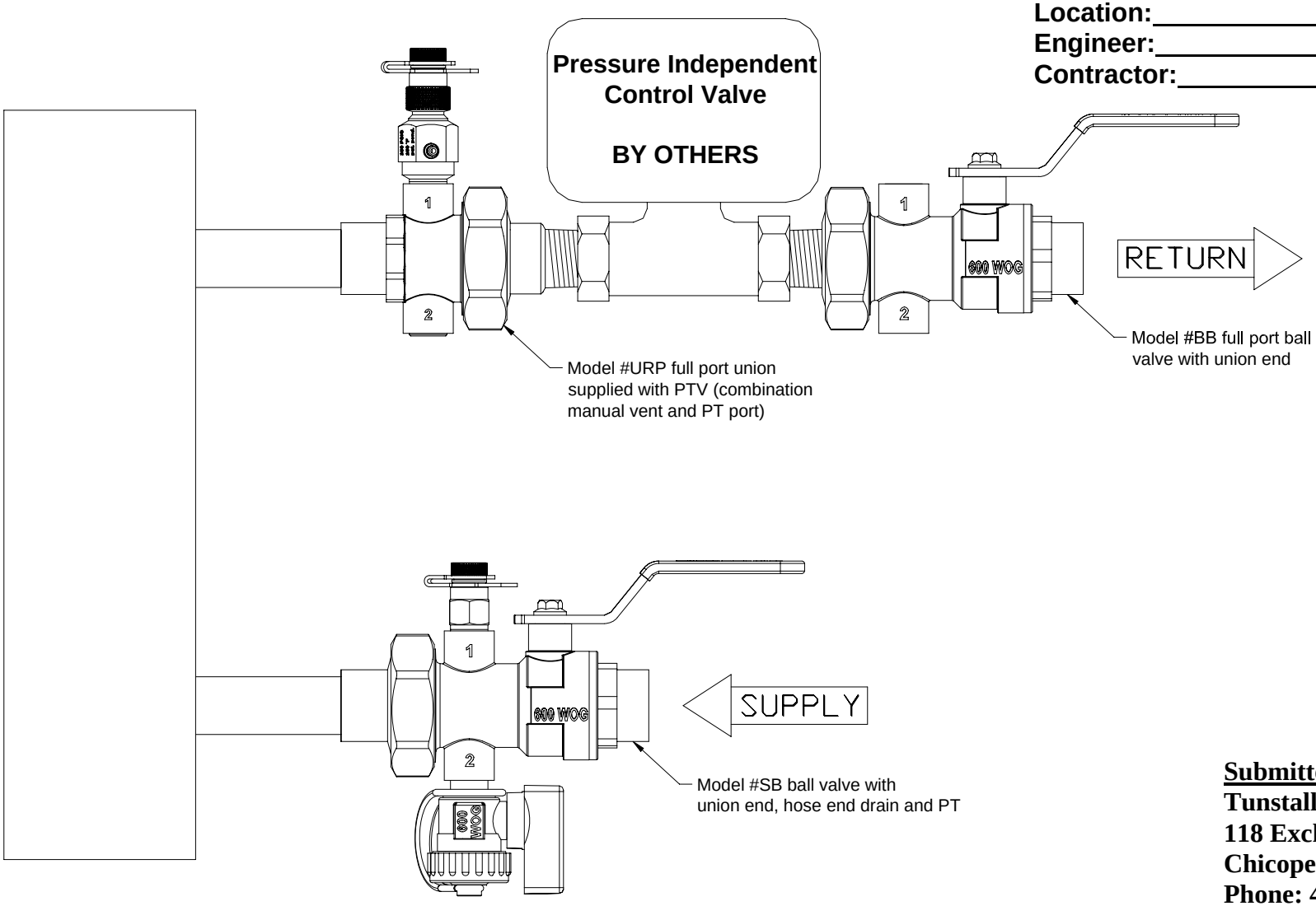
Valve Package (Model # 2RB-BB)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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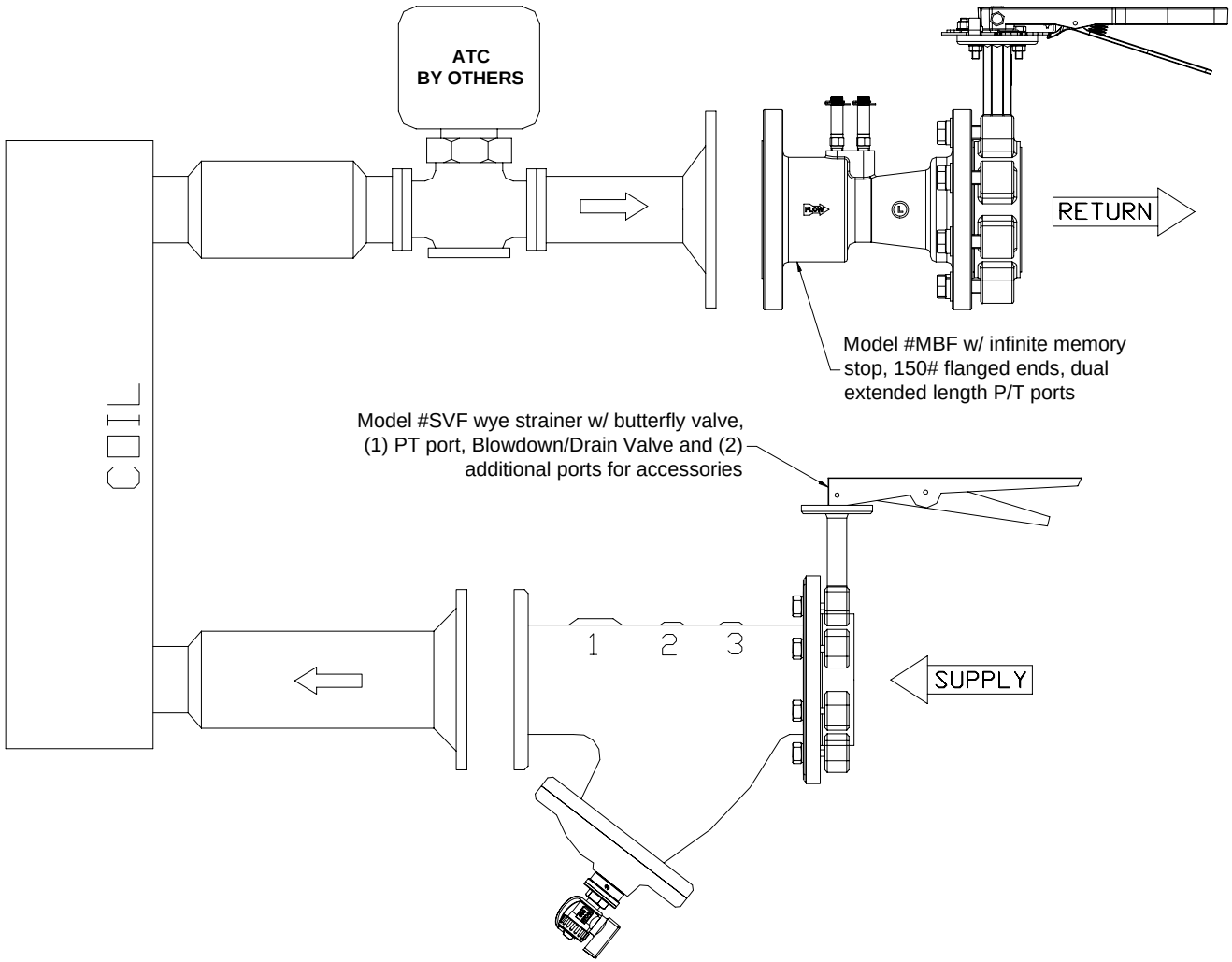
Valve Package (Model #MBF w/SVF)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

MACON® BALANCING
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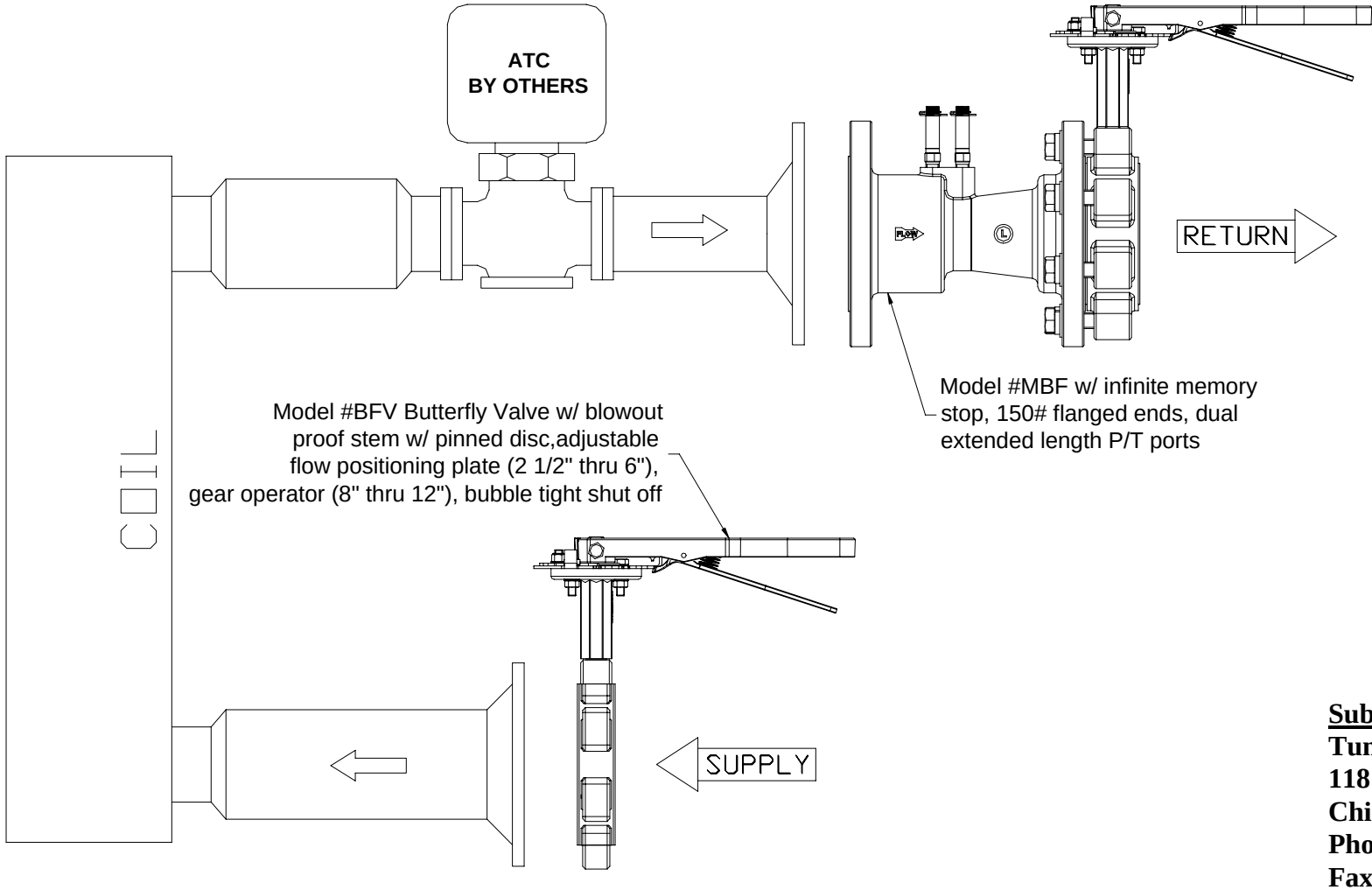
Valve Package (Model #MBF w/BFV)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

MACON® BALANCING
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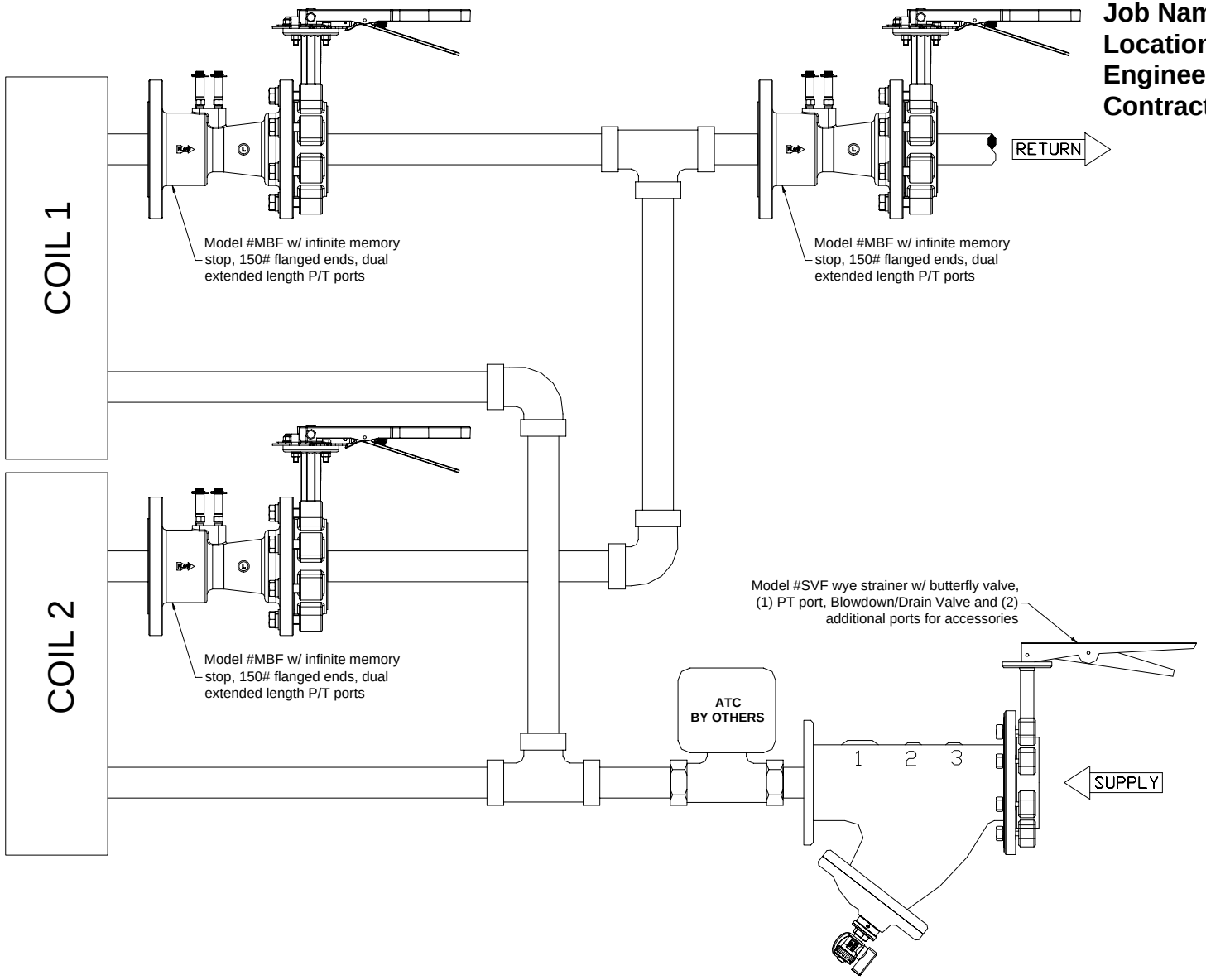
Valve Package (Model #MBF w/SVF DUAL COIL)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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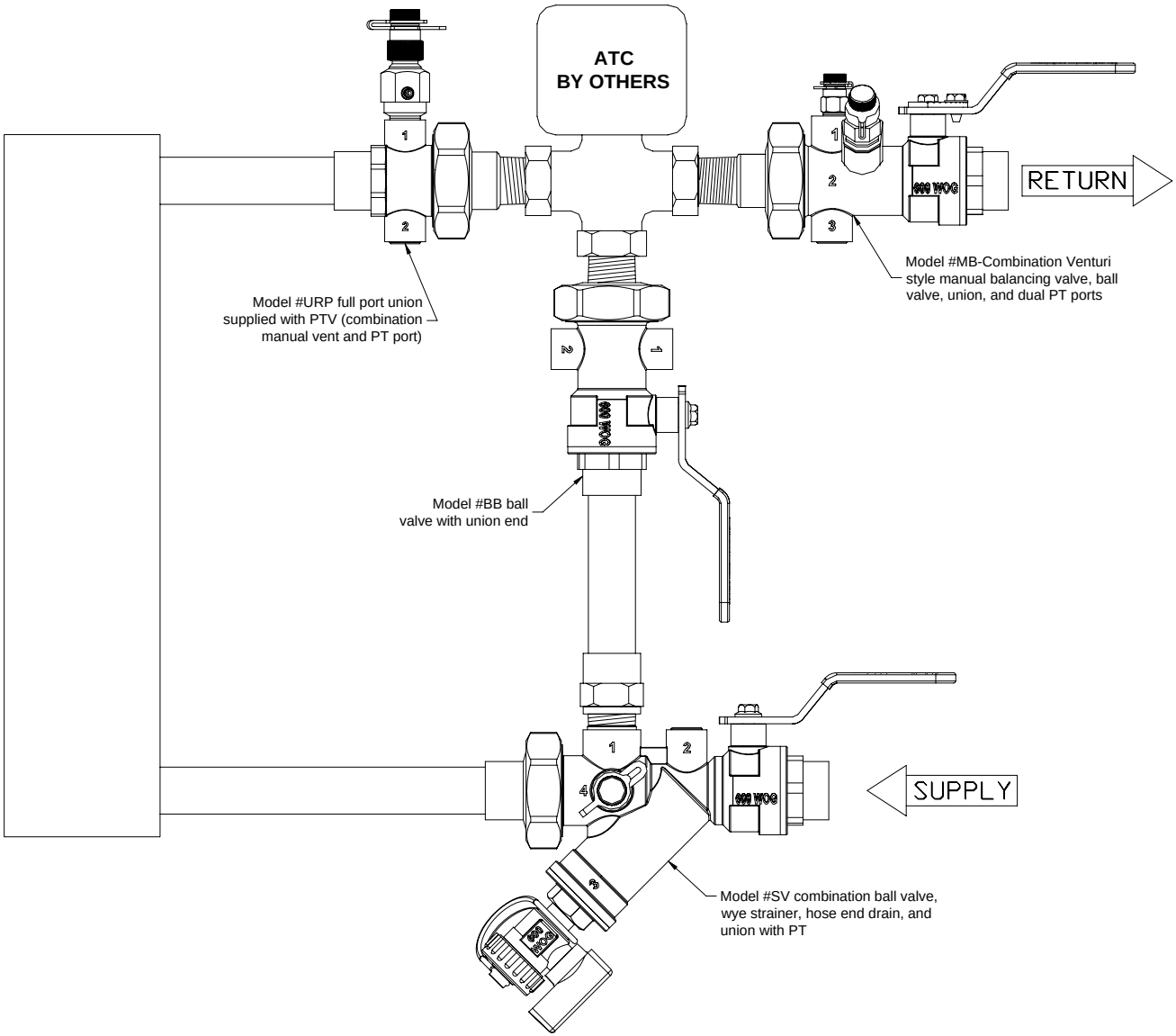
Valve Package (Model # 3RS-MV)



Job Name:_____
Location:_____
Engineer:_____
Contractor:_____

Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

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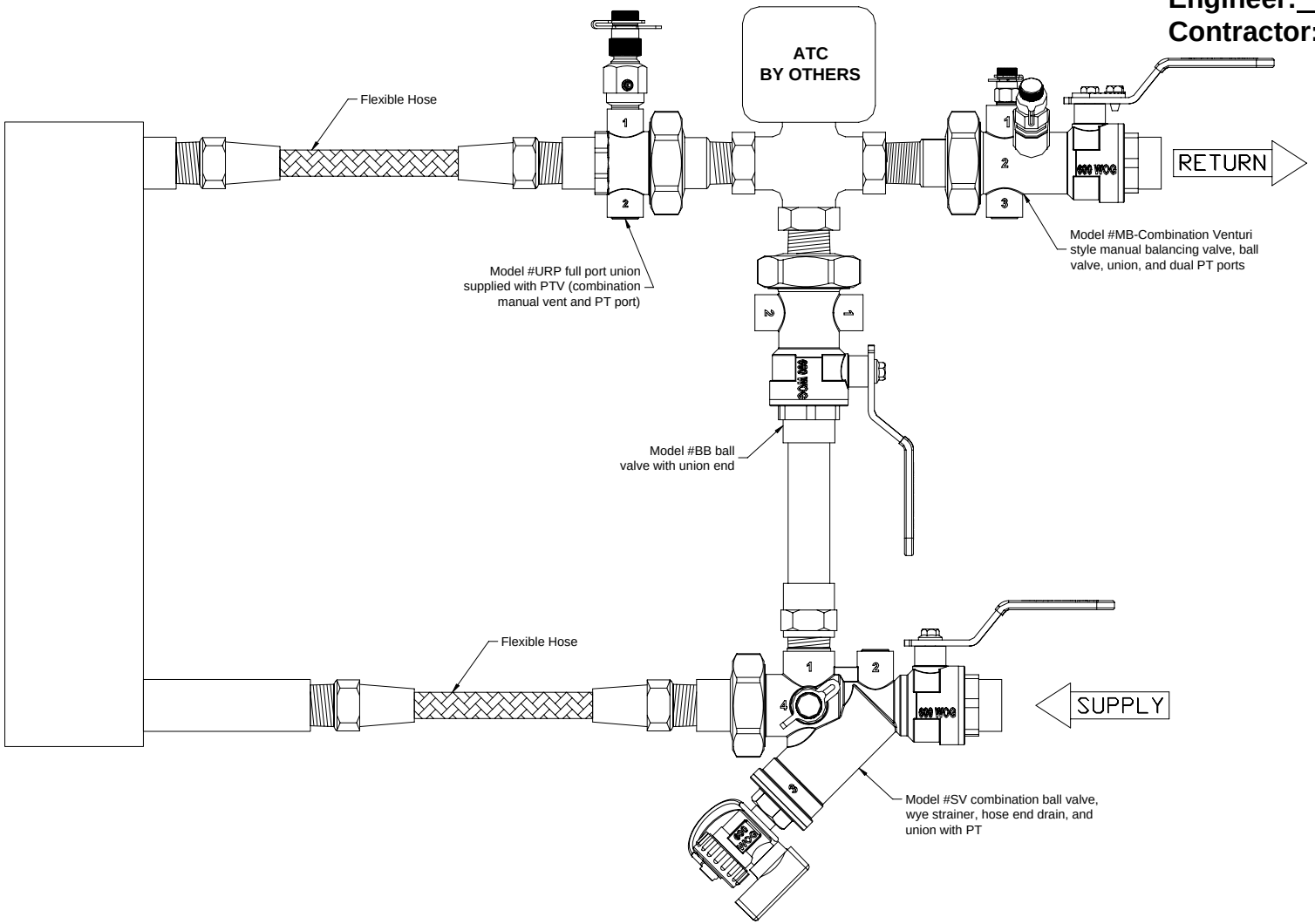
Valve Package (Model # 3RS-MV-FLEX)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

MACON® BALANCING
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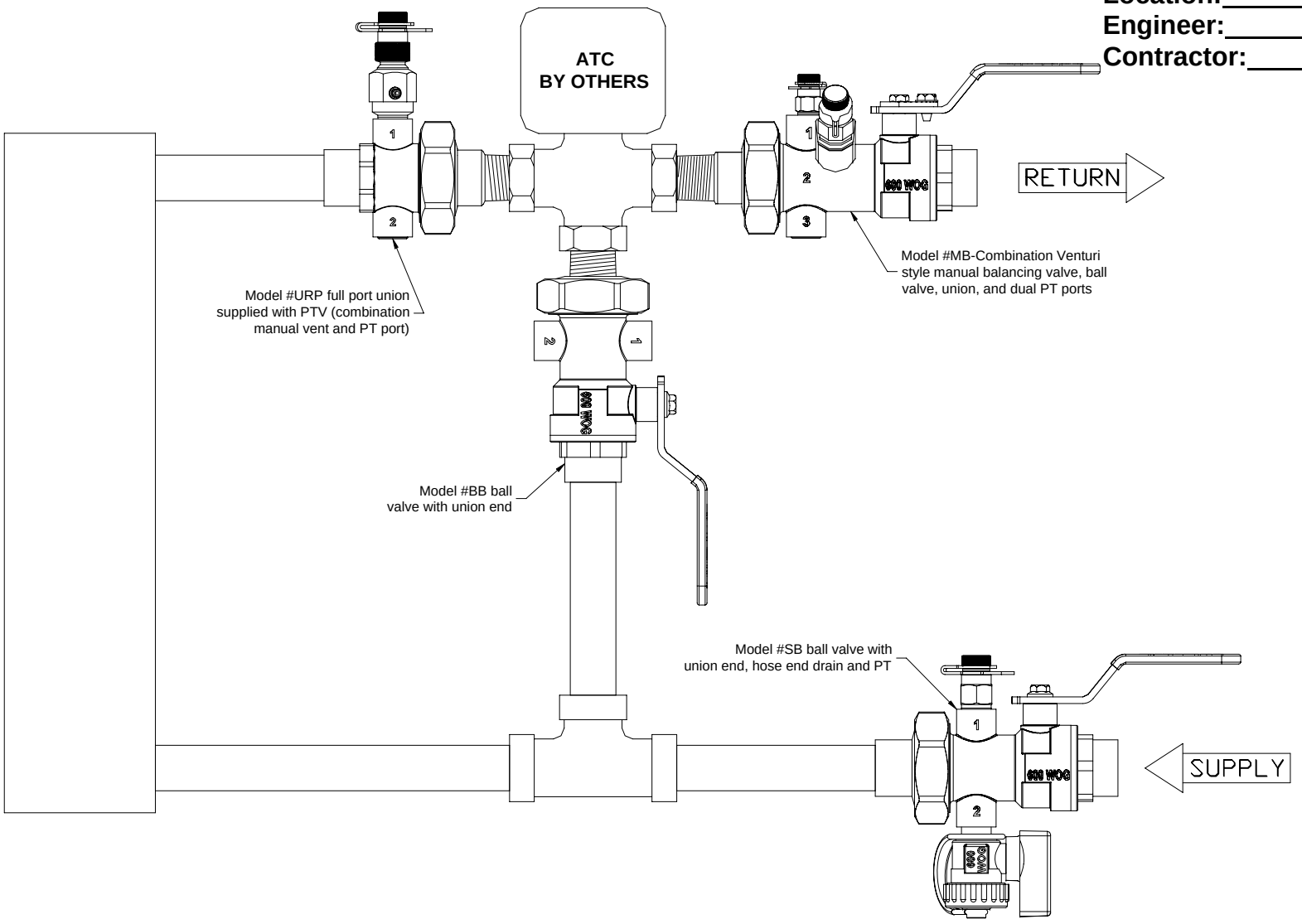
Valve Package (Model # 3RB-MV)

Job Name:_____
Location:_____
Engineer:_____
Contractor:_____



Submitted By:
Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013
Phone: 413-594-8695
Fax: 413-598-8109

INSTALLATION & OPERATING INSTRUCTIONS

THREADED VALVE CONNECTIONS

Macon threaded connections are tapered type (NPT) and should be made up according to industry standards.
Inspect and clean pipe threads on both components and piping.
Apply sealant, either sealing compound tape to the threads.
If the product contains a union nut, remove the nut and O-ring from the assembly. Place the union nut over the pipe past the threads. Install the tailpiece with a socket wrench.
Attach the body section to the other end of the piping.

Rotate the body using the hex flats nearest the joint being tightened. **Do not use a wrench on the main body of the component**. Position the body so that the PT Port, PTV, Vent, Drain Valve and or Valve Handle are in the proper position. Make sure that the flow arrow is pointing in the direction of the flow.
After both ends of the valve are assembled to the piping, reinstall the O-ring and tighten the union nut hand tight and then tighten an additional quarter turn. Care must be taken not to cut or pinch the O-ring.

SWEAT VALVE CONNECTIONS

Macon products with sweat connections are designed to be soft soldered.
Clean both copper tube and component ends with sand paper and / or a wire brush, wipe clean and apply flux uniformly.
If the product contains a union nut, remove the nut and O-ring from the assembly. Place the union nut over the copper tube past the flux surface. Install the tailpiece and / or body on the copper tube with a twisting motion to distribute the flux uniformly when inserted. Position the body so that the PT Port, PTV, Vent, Drain Valve and/or Valve Handle are in the proper position. Make sure that flow arrow is pointing in the direction of the flow.
A heat sink is required during soldering.
An appropriate heat sink is a wet rag wrapped around the component closest to the solder connection.
Ball valves are required to be fully closed during soldering to avoid deformation to the Teflon seat.
Valves should be allowed to cool before operating.

Apply heat with the flame directed way from the center of the body . Do not exceed the rated temperature of the component. Excessive heat will damage internal components such as O-rings, PT seals, and Teflon seats.
After the solder begins to melt, remove the flame and continue to apply solder until a ring is formed completely around the circumference of the joint. While the joint is still hot, remove excess flux and solder.
After both ends of the component have been assembled to the piping, reinstall the O-ring and tighten the union nut hand tight and then tighten an additional quarter turn. Care must be taken not to cut or pinch the O-ring.
The factory installed accessories (PT Port, PTV, Vent and Drain Valve) will withstand the solder temperatures if properly **heat-sinked with a wet cloth.**

Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013

INSTALLATION & OPERATING INSTRUCTIONS

FLANGE VALVE CONNECTIONS

Class 150 Valves are mechanically compatible with standard ANSI 150 lb, flat-faced or raised-faced steel flanges or with 125 lb, cast iron flanges.
Appropriated gasket material must be used when installing flanged-mounted flow control devices (for example 1/16" thick ring type fiber filled gaskets). (Not supplied by Macon). All products have a flow direction arrow. Make sure that it is pointing in the direction of the flow.
Installing the butterfly Valve:
Do not use flange gaskets.

The molded valve gasket will seal against the standard ANSI flanges.
Before tightening any bolts on the butterfly valve, turn the disk of the butterfly to the full open position. Center the valve and hand tighten all bolts. Slowly close the disk to check for adequate disk clearance. When properly aligned, return the disk to the open position and evenly cross-tighten all bolts. Make sure the disk opens and closes properly.

GROOVED END VALVE CONNECTIONS

Grease the pipe ends, valve ends and rubber gasket lips with grease, graphite paste or similar grease.
Slip the rubber gasket over the pipe end of each joint. Slide the gasket past the grooves. Position the grooved end valve between the pipe ends and slide the gaskets back into the central spanned position.
All products have a flow direction arrow. Make sure that it is pointing in the direction of the flow. Apply grease on the outside of the gasket. Install housing clamps over the gasket – insert bolts and nuts.

Tighten nuts evenly, using socket or other wrench. Tighten so that housing clamps come together evenly. The connection is complete when housing clamps meet metal to metal, further tightening of bolts is not necessary.
Pre-assemble large diameter multi-segment housing clamps loosely and install them as half-housings. Take up evenly from top to bottom on alternate bolts.

WELD END VALVE CONNECTIONS

Clean the end of the pipe and the valve where the welds will be made. Make up the assembly butting the connections together. All products have a flow direction arrow. Make sure it is facing in the direction of the flow. Tack weld the assembly together and observe the fit.

Warning: If the valve contains a butterfly valve do not finish welding the assembly with the butterfly valve installed between the flanges. This will result in serious damage to the valve seat.

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INSTALLATION & OPERATING INSTRUCTIONS

PRESSURE TEMPERATURE PORT (PT) / PRESSURE TEMPERATURE VENT(PTV)

PT Ports and PTV are typically factory installed.
Factory installed accessories (PT Port, PTV, Vent and Drain Valve) are installed with a hydraulic sealant and should not be disturbed. If it is absolutely necessary to remove, tighten and/or adjust an accessory, it should be cleaned and resealed with new sealant and/or Teflon tape.
Care should be taken not to over tighten.
Field installations are done in accordance with general plumbing/fitting practices. Pipe dope or Teflon tape should be used to seal threads.
Do not expose PT Ports and PTV to soldering, brazing or weld heat. Complete this work before installing the PT Ports and/or PTV.
The PTV should always be installed in a vertical position.
It is preferable to install the PT Port horizontally or higher.
Do not install down at the 6 o'clock position.

SAFETY INSTRUCTIONS

Seals are made of EPDM. EPDM is compatible with hot and cold water. EPDM is resistant to: glycol, alcohol, phosphates, esters, ketones and detergents.
Do not use with: Petroleum products, hydrocarbons solvents and/or oils, chlorinated hydrocarbon or turpentine.
Always wear eye protection when using PT Ports and/or PTV.

Attach a drain hose to the hose barb connection for collecting water or water vapor from the PTV.
Always use a pressure gauge with a rating greater than the pressure in the system.
Recommended for use in hydronic systems only.
Not recommended for gas, steam or high temperature hot water.

OPERATION

PTV Venting:
Venting is achieved by rotating the valve body ½ turn or until you hear air escape. Close valve when venting is completed.

PT Port and PTV Temperature/Pressure Readings:
Remove cap slowly, look and listen for leaks.
Remove any foreign material from the entrance hole.
Select either the pressure or the temperature device to be used. Examine the probe and remove any existing burrs. Apply silicone lubricant to the probe, especially for first time use. Insert probe slowly with a twisting motion. As soon as the necessary readings and adjustments are made, remove the probe and replace cap.

MAINTENANCE

If the device leaks persistently, replace it.
Keep debris out of the device and keep caps on.

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118 Exchange Street
Chicopee, MA 01013

INSTALLATION & OPERATING INSTRUCTIONS

AUTOMATIC BALANCING VALVES

INSTALLATION

There are no minimum straight-piping requirements for the inlet or the outlet.
Valves may be installed in horizontal or vertical lines.
The flow arrow on the valve body must be pointed in the direction of flow.
Avoid placing the valve close to a pump discharge. Allow 10' before the valve if possible.

OPERATION

Macon Automatic Balancing Valves incorporate a removable flow cartridge that is factory set to limit the GPM to within ± 5% of the specified flow.
The flow can be verified by measuring the differential pressure (D.P.) across the valve using the PT Ports provided.
If it measures between 2-32 the flow is with in the specified flow range.

MAINTENANCE

There is no periodic maintenance required on the Automatic Balancing Valve.
Using a Y strainer is always recommended to prevent clogging. A 40 mesh screen is recommended for flow of 1.5 GPM or less.
The controlled flow rate can be changed in the field without having to remove the valve from the line.
Isolate the system, relieve pressure and drain water. Carefully remove the cap and pull out the cartridge with your fingers. When refitting make sure the O-ring on the cartridge and cap are in place.

MANUAL BALANCING VALVES

INSTALLATION

Macon Manual Balancing Valves & Venturi's are unidirectional, observe flow arrows.
All models can be installed in horizontal or vertical pipe.

STRAIGHT-RUN REQUIREMENTS

The MB models have the necessary straight-run length built in and can be installed directly downstream of a 90 degree elbow or a control valve. If the control valve is smaller then the MB, than the reduction can be done with a Macon tailpiece or reducing coupling to insure a proper reading.
Models MBF, MBG, VF, VG and VW can be installed with no additional pipe diameters upstream or down-stream for line size connections.

Tap Locations (Pressure Taps or PT Ports).
For portable D.P. metering, the taps can be pointing at any clock location, except at 6 o'clock.
Optional accessories such as air vents should always point up and drain down.

OPERATION

The flow is determined by measuring the differential pressure (D.P.) across the high (Red) and low (Blue) taps on the venturi. Convert the measured D.P. to inches W.C. and use the appropriate Macon chart to read the flow.

CHART	MODELS
FCMB-0413	.50" – 2.00" MB
FC1-0413	2.50" – 6.00" MBF, MBG, VF, VG, VW
FC2-0413	8.00" – 12.00" MBF, MBG, VF, VG, VW

Models MB and MBF are equipped with a downstream throttling valve to adjust the flow.
Slowly close the valve while reading the D.P. gauge until the desired flow is reached. Set the memory stop so the handle position is maintained even if the valve is temporarily closed.

MAINTENANCE

There is no periodic maintenance required on these devices.

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118 Exchange Street
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Flexible Hoses

Installation:
1. Adhere to allowable radius of bend. (See table below)
2. Verify the installation conditions do not cause torsion of flexible. (See figure1 below)
3. If necessary modify the installation in the event that it is not possible to adhere to the allowable radius of bend (see paragraph 1 below). For example, add an intermediary right angle fitting (See figure 2 below).
4. Do not submit the connectors to tension, either from the installation, or as a result of pressure or expansion (see figure 3 below).
4. The braiding of the flexible must never be in contact with cement, plaster or all other materials or fluids capable of causing corrosion.

FIGURE 1

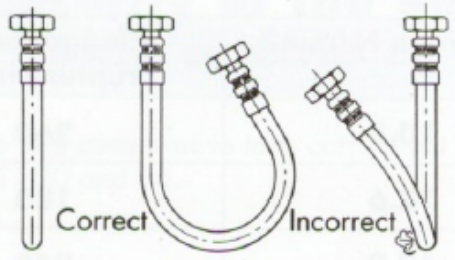


FIGURE 2

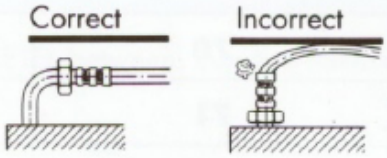
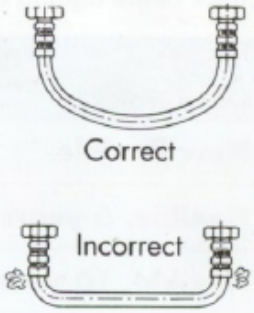


FIGURE 3



ON INSTALLATION: Avoid absolutely any tension due to stretching during the course of tightening the connectors. Do not turn fittings in the hose. Do not twist hose. Avoid sharp bends, kinking or twisting of the hose during installation. The ½", 3/4" and 1" hose connection is a metal to metal seal. The brass mating surfaces should be smooth and free of debris. The 1-1/4", 1-1/2" and 2" hose connection use a specially design gasket, do not install without the gasket. Do not use pipe dope or tape sealants on the metal to metal or gasket connection adapters when connecting to the swivel nut.

A. Install and tighten the fixed male connector.
B. Remove the swivel adapter from the swivel nut. Install and tighten the union adaptor.
C. Install and tighten the adapter to the swivel nut.
Use two spanners in order to screw the union together:
One to hold the hexagon of the adaptor.
The other to tighten the nut at the same time.

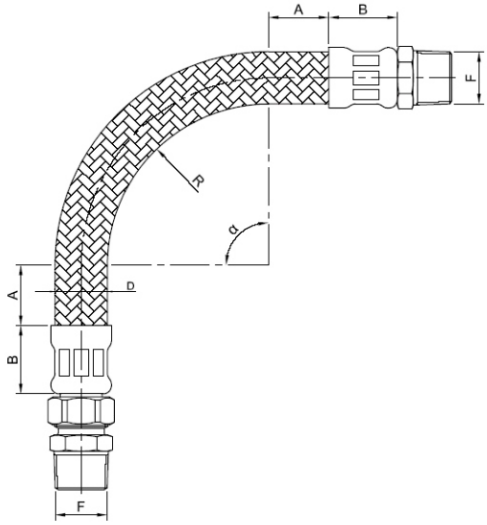
IMPORTANT: Do not re-screw the fixed connector or adaptor after tightening of the swivel nut ; this will cause tensioning of the flexible with a risk of rapid deterioration at this point.
On removal, take precautions. If the flexible incorporates two fixed connectors, at least one must be installed on a counter-part fitting with a swivel connector or a union, if not installation is impossible.

INSPECTION: Macon recommends a good maintenance practice and periodic inspections, typically when servicing other components at the unit or at the installation site. Check all hoses for small water leaks, residue, discoloration on the exterior braid and fittings. If a leak is detected, stop service to the unit and replace hose immediately. Do not attempt to the repair hose.

Caution: Introduction of chemicals into the system or unit may cause damage to the inner core of the hose. Consult a water treatment specialist for chemical compatibility before using any chemical additives.

Warning: Hoses are designed for hydronic heating and cooling service only, not for gas.

FLEXIBLE ALLOWING A BEND



I.D.	F	Length (inch)	R_{min} (mm)	A_{min} (mm)	B (mm)	D (mm)	α_{max}
13	1/2 - 14 NPT	12 "	60	40	23	17	89°
		18 "	60	40	23	17	180°
		24 "	60	40	23	17	180°
		36 "	60	40	23	17	180°
19	3/4 - 14 NPT	12 "	80	55	35	26	32°
		18 "	80	55	35	26	126°
		24 "	80	55	35	26	180°
		36 "	80	55	35	26	180°
25	1 - 11,5 NPT	12 "	110	65	35	35	5°
		18 "	110	65	35	35	75°
		24 "	110	65	35	35	142°
		36 "	110	65	35	35	180°
32	1¼ - 11,5 NPT	18 "	120	100	46	42	30°
		24 "	120	100	46	42	92°
		36 "	120	100	46	42	180°
40	1½ - 11,5 NPT	18 "	200	140	62	53	5°
		24 "	200	140	62	53	27°
		36 "	200	140	62	53	104°
50	2 - 11,5 NPT	24 "	280	230	57	63	5°
		36 "	280	230	57	63	42°

MACON® BALANCING

LIMITED WARRANTY

Macon warrants that our products are free from defects in material and workmanship and will possess the characteristics represented by us for a period of 12 months from the date of shipment.

Upon satisfactory proof of claim, we will, within a reasonable time, make any necessary repairs, additions or corrections or, at our option, replace defective parts free of charge. Charges for correcting defects or making additions will not be allowed, nor will we accept products returned for credit unless the return is authorized by us in writing.

This warranty shall not apply to any material which has been subject to misuse, negligence, modification, temperature or pressures in excess of the limits recommended by Macon.

Macon makes no other warranties either expressed or implied, including the warranties of mechanical ability or fitness for a particular purpose. The company neither assumes nor authorizes any other persons to assume for it any liability in connection with the sales of its parts and material except under the conditions of this warranty. There are no warranties which extend beyond the description on the face hereof.

Macon is not liable for incidental or consequential damages including, but not limited to, damage or delay, loss of profit or expense incurred by the purchaser.

Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013

GUIDE SPECIFICATIONS – STVL / STV / STVA / STVC BALANCING VALVES

TYPICAL SPECIFICATION

All balancing valves shall be of one manufacturer.

Furnish and install, as shown on job plans and in accordance with manufacturers installation instructions, Macon Balancing Valves, Series STVL/STV/STVA/STVC. Valves are to be of "Y" pattern globe style design and perform the following functions: a) Flow balancing, b) Flow measurement, c) Positive shut-off.

All balancing valves must have a minimum ten (10) turn, 360° handwheel with digital and vernier scale readout for precise setting. Balancing handwheel must include a memory stop and locking feature to prevent tampering after pre-setting.

All balancing valves shall have self-sealing ports for measurement of differential pressure and fluid temperature using standard pressure and temperature test probes. Test ports shall be located at a 45° offsetting angle and be removable for implementation of optional drain kits where required.

All balancing valves in sizes 1/2" (DN 15) through 2" (DN 50) shall be made of dezincification resistant brass and have either sweat or NPT thread connections. Valve body sizes 2 1/2" (DN 65) through 12" (DN 300) shall be made of cast iron and flanged to 125 lb standard.

All balancing valves shall be manufactured by the company complying with international quality standard ISO 9001.

Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013

MACON® BALANCING

GUIDE SPECIFICATIONS – AUTOMATIC BALANCING VALVES

MANUFACTURER

1. Macon Balancing, Models AB, ABW, ABG and AW.

DESIGN

1. The GPM for the automatic balancing valves shall be factory set and shall automatically limit the rate of flow to with in ±5% of the specified GPM over at least 95% of the control range.
2. For .50" through 2.0" the flow cartridge shall be removable from the Y Body housing without the use of special tools to provide access for cartridge change-out, inspection and cleaning without breaking the main piping.
3. PUMP HEAD REQUIREMENT:
   The permanent pressure loss added to the pump head shall not exceed seven feet.
4. Each valve shall have 2 P/T Ports.
5. The valve handle shall be fitted with a fine tuning memory stop handle to allow for adjusting the control range.

CONSTRUCTION

1. The internal wear surfaces of the valve cartridge shall be Ultrason® Composite or stainless steel.
2. The flow cartridge shall be permanently marked with the GPM and differential range.
3. For .50" through 2.0" pipe sizes: An assembly shall consist of a brass Y-type body, integral brass-body ball valve and O-ring type union.
   Macon model AB.
4. For 2.5" and larger flanged connections:
   Ductile-iron body, suitable for mounting wafer style between standard 150# or 300# flanges.
   The long flange bolts and nuts shall be provided with each control valve.
   Macon model AW.

MINIMUM RATINGS

1. For .50" through 2.0" pipe sizes
   600 PSI @ 250°F.
2. For 2.5” through 12.0” pipe sizes
   600 PSIG @ 250°F.

FLOW VERIFICATION (choose one)

1. The differential pressure across the Automatic Balancing Valve shall be measured for flow verification and to determine the amount of system over heading or under pumping.
2. The flow shall be verified by measuring the differential pressure across the coil served or the wide open temerature control valve and calculating the flow using the coil or valve Cv.

TEST KIT

1. A pressure and temperature test kit shall be provided with the ability to read differential pressure from 0 to 75 PSI, and temperature from -10 to 230° F.

INSTALLATION

1. Install automatic balancing valves on the return lines of coils as indicated on the plans. A balancing valve on the supply side is not acceptable.
2. The standard ports and handle shall clear 1.0" thick insulation. Do not insulate flow control valves used on heating coils.
3. Install, on the supply side of coils, a Y-strainer with brass blow down valve with .75" hose-end connection with cap. Inline basket strainer is not acceptable.

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118 Exchange Street
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MACON® BALANCING

GUIDE SPECIFICATIONS – MANUAL VENTURI BALANCING VALVES

MANUFACTURER

1. Macon Balancing, Models MB or MBF

DESIGN

1. Flow devises shall be Venturi type as recommended by ASHRAE.
2. Devices shall have a precision-machined throat and have a stated catalog accuracy of 3% of flow rate.
3. MINIMUM GAUGE READING: The gauge reading (flow signal) shall be at least two feet at the design flow with the valve in the wide open position.
4. The valves are to have differential readout ports fitted with check valve and protective cap, and are to have a memory stop to allow complete shut-off and return to set position with out losing the set point.
5. PUMP HEAD REQUIREMENTS: The permanent pressure loss added to the pump head shall not exceed two feet, per device, at the design GPM in the wide-open position.

CONSTRUCTION

1. All devices shall have a Venturi section and a throttling valve with a memory stop on the downstream side of the Venturi.
2. Sizes .50" - 2.0" shall have a brass alloy body with sweat or threaded (NPT) connections, ball valve shall have a plated brass ball, blowout-proof brass stem, union end which will except various type tailpieces, Teflon seat, EPDM o-ring seals, and a steel handle.

   Sizes 2.5" – 6" shall have a cast steel body. Flanges shall be compatible with ANSI B16.5-1968 150lb. Butterfly Valve shall be ductile iron lug type, with EPDM seats, 416 SS stem, Teflon bushing, aluminum/bronze disc.
3. All valves .50" – 2.0" shall be factory leak tested at 100PSI air under water.

MINIMUM RATINGS

1. Devises with sweat or NPT connections .50" – 2": 400 PSIG @ 250°F.
2. Devises with Flanged connections 2" – 10": 200 PSIG @ 250°F.

READOUT METER KIT

Provide a portable readout meter kit by the manufacturer of the balancing devices.

1. The meter shall be housed in a durable case complete with two 10’ color coded hoses with shut-off valves at the end that connects to the balancing valve so that water does not drain out between readings.
2. Meter shall have a 6" diameter face and ±1.75% full-scale accuracy.
3. Meter shall have a forged brass body and a three-valve manifold for over-range protection.
4. Meter shall have a dual scale reading inches and feet W.C.

INSTALLATION

1. The straight pipe required to achieve 3% F.S. accuracy shall be incorporated as an integral part of the .50" to 2" valve assembly. Five pipe diameters of straight pipe are required from a control valve for sizes 2.5" – 10".
2. Install balancing valves on the return lines of the coil as recommended by ASHRAE.
3. Install in accordance with the manufacturer’s instructions.

Tunstall Corporation
118 Exchange Street
Chicopee, MA 01013

GUIDE SPECIFICATIONS – HOOK–UP COMPONENTS

UNIONS

Manufacturer
Macon Balancing
Models UR, URP, US, UB.

Design and Material
.50" – 2.0" Brass O-ring type Union. EPDM O-ring. Fixed End available in FNPT or SWT. Tailpiece available in MNPT, FNPT, SWT or Press End. Size reductions available. Ground joint type not acceptable.

Minimum Ratings
600 PSIG @ 250°F

Y-STRAINERS

Manufacturer
Macon Balancing
Models SV, SVF.

Design and Material
.50" – 2.0" Forged or cast brass body. EPDM O-ring. Plated steel handle with vinyl grip. Blow out-proof stem. Chrome plated ball with Teflon seats. 20 mesh stainless steel screen with removable cap. Fixed End available in FNPT, SWT or Press End. Tailpiece available in MNPT, FNPT, SWT or Press End. Size reductions available. Strainer shall be fitted with a hose end blow down valve with cap and chain.
2.5" – 12.0" Cast iron body. Fiber gasket. Stainless steel strainer screen. ANSI 125# Flanged. Lug type ductile iron butterfly valve mounted on the inlet.

Minimum Rating
.50" – 2.0" 600 PSIG @ 250°F
2.5" – 12.0" 175 PSIG @ 250°F.

MANUAL AIR VENTS

Manufacturer
Macon Balancing
Models MAV, PTV.

Design and Material
MAV Brass body. Knurled slotted handle. Blowout-proof stem. Side vent. 1/4" NPT. Standard and Extended length.
PTV Brass body, EPDM core and O-rings. Knurled handle and cap. Blowout-proof stem. Side vent with 1/8" hose barb. 1/4" and 1/2" NPT. Standard and Extended length.

Minimum Ratings
MAV 400 PSIG @ 250°F
PTV 250 PSIG @ 250°F

AUTOMATIC AIR VENTS

Manufacturer
Macon Balancing
Model AAV

Design and Material
Forged brass body, manual shut-off cap. Polypropylene float. Body designed to be disassembled for cleaning. Vent capacity 1 SCFM @ 60 PSIG.

Minimum Ratings
150 PSIG @ 250°F

HOOK–UP COMPONENTS continued –

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GUIDE SPECIFICATIONS – HOOK–UP COMPONENTS cont.

HOSES

Manufacturer
Macon Balancing
Models FH

Design and Material
.50" – 2.0" inner core of EPDM suitable for water temperatures between 40°F and 230°F.
Outer braided cover of stainless steel with brass fittings. Double Crimp SS Ferrules.

Minimum Ratings
Temperature Range: 5°F to 212°F
1/2" 375 PSIG Operating, 1500 PSIG Burst
3/4" 300 PSIG Operating, 1200 PSIG Burst
1.0" 225 PSIG Operating, 900 PSIG Burst
1.25" 200 PSIG Operating, 800 PSIG Burst
1.50" 175 PSIG Operating, 600 PSIG Burst
2.0" 150 PSIG Operating, 500 PSIG Burst

BALL VALVES

Manufacturer
Macon Balancing
Models AB, BB, MB, SB

Design and Material
.50" – 2.0" forged or cast brass body.
EPDM O-ring. Plated steel handle with vinyl grip.
Blow out-proof stem. Chrome plated ball with Teflon seats. Fixed End available in FNPT, SWT or Press End. Tailpieces available in MNPT FNPT, SWT or Press End. Size reductions available.

Minimum Ratings
600 PSIG @ 250°F

PRESSURE / TEMPERATURE PORTS

Manufacturer
Macon Balancing
Models PT, PTV

Design and Materials
PT Brass body. Dual durometer EPDM core.
Brass cap with EPDM O-ring and neoprene strap.
Accepts 1/8" diameter gage adapter or thermometer stem. 1/4" and 1/2" NPT.
PTV Brass body. Dual durometer EPDM core.
Brass cap with EPDM O-ring and neoprene strap.
Side air vent with 1/8" hose barb. Accepts 1/8" diameter gage adapter or thermometer stem.
1/4" and 1/2" NPT.

Minimum Ratings
PT 500 PSIG @ 250°F
PTV 250 PSIG @ 250 °F

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