

# Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

The Tour & Andersson calibrated balancing valves offer a reliable, simple and cost effective way to measure and balance all flow rates. Full throttling range is achieved by 4, 8, 12 or 16 full turns of the handwheel, enabling a precise setting. This high degree of accurate adjustment means that the system can be balanced precisely.

The actual pressure drops in heating and cooling systems are difficult to establish by calculation because water flows are frequently incorrect. They can be corrected easily by regulating the desired water flow with Tour & Andersson globe style balancing valves. By measuring the pressure drop across measuring ports at a particular handwheel setting, the water flow for the valve size can be read easily from the appropriate pressure drop graph or flow balancing wheel. If the flow does not conform with that specified, adjust the valve and repeat the measuring procedure until the correct flow has been obtained. Insulation kits are available for ½ – 6”/15 – 150mm sizes for Series 786, 787, 788 and 789 Tour & Andersson Circuit Balancing Valves.

NOTE: All Tour & Andersson Circuit Balancing Valves include a concealed memory feature with a locking tamper-proof setting.

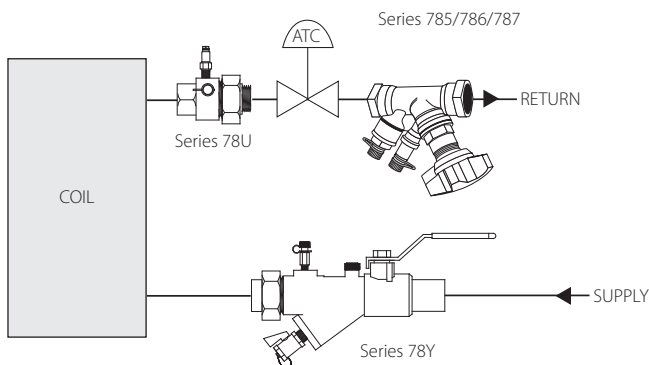
Series 785, 786, 787 and 78Y have an Ametal® body. Ametal is a copper alloy that also eliminates the added expense of dielectric fittings. The Series 78U has a brass body.

Series 788 and 789 have ductile iron bodies and Ametal or ductile iron trim, depending on size. Test points feature self-sealing construction for insertion-type pressure or temperature probes.

All valves are rated to +250°F/+120°C and -4°F/-20°C. Service will be governed by the connecting coupling gasket ratings for grooved and flanged valves.



BALANCING KOIL-KIT HOOK-UP PACKAGE



<b>JOB/OWNER</b>	<b>CONTRACTOR</b>	<b>ENGINEER</b>
System No. _____	Submitted By _____	Spec Sect _____ Para _____
Location _____	Date _____	Approved _____
		Date _____

## Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

### MATERIAL SPECIFICATIONS

#### Circuit Balancing Valves

##### BODY:

**Series 785, 786, 787:** Ametal, nonferrous pressure die cast, nonporous copper alloy  
**Series 788, 789:** Ductile iron, ASTM A536 Grade 80-55-06 (BS Grade 500/7)

##### BODY COATING

**Series 788, 789:** 2 ½, 3, 4" – Epoxy resin; 5-12" – painted

##### TRIM: (Bonnet, Stem and Restriction Cone)

**Series 785, 786, 787:** Ametal

**Series 788, 789:**

Bonnet – 2 ½ – 6" – Ametal

Bonnet – 8 – 12" – Ductile Iron

Stem: Ametal

Restriction Cone: Ametal

##### SEAT:

**Series 785, 786, 787:** Ametal

**Series 788, 789:** Ductile Iron

##### SEAT SEAL:

**Series 785:** Ametal

**Series 786, 787, 788, 789:** EPDM

##### STEM SEALS: EPDM

##### PROBE SEALS: EPDM

**OPTIONAL SEAT, STEM AND PROBE SEALS:** Fluoroelastomer (available on 1 ½ and 2" Series 787; 2 ½ – 10" Series 789 (except 5"). Contact Victaulic for availability.

##### HANDWHEEL:

**Series 785:** ½-¾" sizes are fitted with a red Polyamide plastic hand wheel

**Series 786, 787:** ½-2" sizes are fitted with a red Polyamide plastic hand wheel

**Series 788, 789:** 2 ½-6" sizes are fitted with a red Polyamide plastic hand wheel; 8-12" sizes are fitted with an aluminum hand wheel

##### OPTIONAL EQUIPMENT:

**Series 786, 787:** Drain kit-Ametal

**Series 786, 787:** Insulation Kit-Polyurethane. Also available on Series 789 2 ½-6" sizes.

#### Koil-Kit Components

##### BODY:

**Series 78Y:** Ametal

**Series 78U:** Forged Brass

##### UNION:

**Series 78Y, 78U:** Brass with EPDM o-ring

##### SEALS: EPDM o-ring

##### BALL VALVE STRAINER COMBINATION:

**Series 78Y:** Teflon packing, brass packing nut, plated ball, steel handle with vinyl grip, blowout-proof stem, 20 mesh stainless steel strainer and seal is brass with EPDM o-ring

#### Allen Wrench Sizes

3mm memory ½-2" valves

5mm memory 2 ½-6" valves

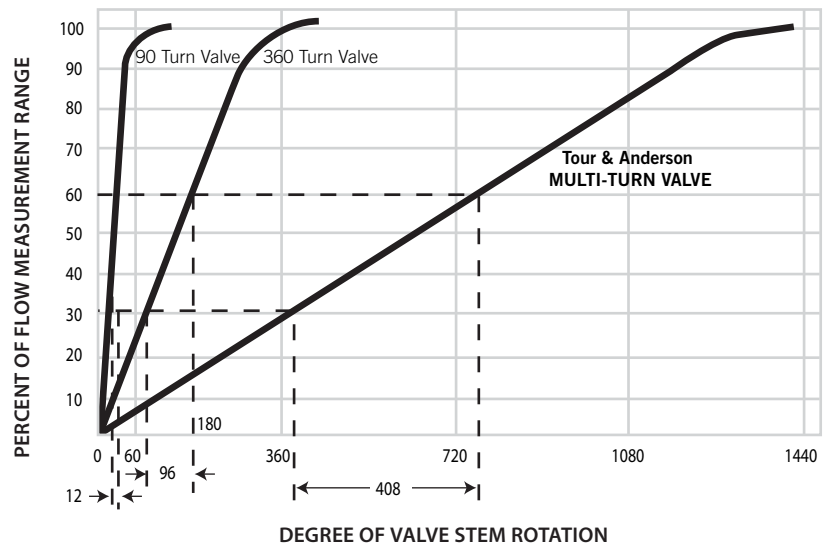
8mm memory 8-12" valves

5mm drain kit ½-2" valves

## Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

### COMPARISON OF CIRCUIT BALANCING VALVE THROTTLING CHARACTERISTICS

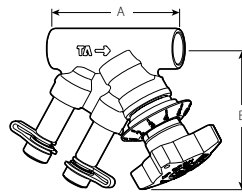
- This curve illustrates the advantage of the four (4) turn adjustment available with Tour & Andersson balancing valves (½ – 2"/15 – 50mm). Valves 2 ½"/65mm and larger have 8, 12 or 16 turns.
- A 90° fully open to closed valve requires just a 12° change in adjustment to equal 30% change of the flow.
- A 360° fully open to closed valve would require 96° change in adjustment to equal the same 30% change in the flow measurement.
- Tour & Andersson balancing valves would require a 408° change in adjustment to equal the same 30% change in the flow.



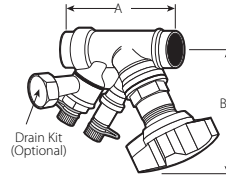
# Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

## Balancing Valve

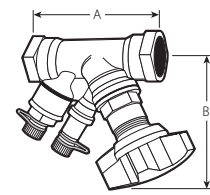
- SERIES 785** Solder Style
- SERIES 786** Solder End
- SERIES 787** Female Threaded End



**SERIES 785**  
TYPICAL ½ - ¾"/15 - 20 MM SIZES



**SERIES 786**  
TYPICAL ½ - 2"/15 - 50 MM SIZES



**SERIES 787**  
TYPICAL ½ - 2"/15 - 50 MM SIZES

Size		Series 785 Solder Style (250 psi/1720 kPa) Balancing Valve			Series 786 Solder End (300 psi/2065 kPa) Balancing Valve			Series 787 NPT (Female) Threaded End (300 psi/2065 kPa) Balancing Valve		
Nominal Size Inches/mm	Actual Outside Dia. Inches/mm	A End to End Inches/mm	B Center to Top Inches/mm	Approx. Weight Each Lbs./kg	A End to End Inches/mm	B Center to Top Inches/mm	Approx. Weight Each Lbs./kg	A End to End Inches/mm	B Center to Top Inches/mm	Approx. Weight Each Lbs./kg
½	0.840	2.68	2.88	1.0	3.50	4.00	1.4	3.50	4.00	1.5
15	21.3	68	73	0.5	89	102	0.6	89	102	0.7
¾	1.050	3.42	3.07	1.0	3.81	4.00	1.4	3.81	4.00	1.6
20	26.7	87	78	0.5	97	102	0.6	97	102	0.7
1	1.315	—	—	—	4.31	4.50	1.9	4.31	4.50	2.0
25	33.7	—	—	—	110	114	0.9	110	114	0.9
1¼	1.660	—	—	—	4.88	4.31	2.4	4.88	4.31	2.6
32	42.4	—	—	—	124	110	1.1	124	110	1.2
1½	1.900	—	—	—	5.13	4.75	3.1	5.13	4.75	3.3
40	48.3	—	—	—	130	121	1.4	130	121	1.5
2	2.375	—	—	—	6.13	4.75	4.5	6.13	4.75	5.0
50	60.3	—	—	—	156	121	2.0	156	121	2.3

## VALVE SELECTION GUIDE

Size		Series 785 Solder Style (250 psi/1720 kPa) Balancing Valve			Series 786 Solder End (300 psi/2065 kPa) Balancing Valve			Series 787 NPT (Female) Threaded End (300 psi/2065 kPa) Balancing Valve		
Nominal Size Inches/mm	Actual Outside Dia. Inches/mm	Minimum Flow GPM/LPM	Nominal Range of Flow GPM/LPM	Maximum Flow GPM/LPM	Minimum Flow GPM/LPM	Nominal Range of Flow GPM/LPM	Maximum Flow GPM/LPM	Minimum Flow GPM/LPM	Nominal Range of Flow GPM/LPM	Maximum Flow GPM/LPM
½	0.840	0.27	0.5 - 3.0	9.5	0.13	0.5 - 2.8	8.6	0.13	0.5 - 2.8	8.6
15	21.3	1.02	1.9 - 11.4	36.0	0.49	1.9 - 10.6	32.6	0.49	1.9 - 10.6	32.6
¾	1.050	0.38	3.0 - 4.0	15.0	0.39	2.8 - 6.0	20.0	0.39	2.8 - 6.0	20.0
20	26.7	1.44	11.4 - 15.1	56.8	1.48	10.6 - 22.7	75.7	1.48	10.6 - 22.7	75.7
1	1.315	—	—	—	0.45	6.0 - 10.0	30.0	0.45	6.0 - 10.0	30.0
25	33.7	—	—	—	1.70	22.7 - 37.9	113.6	1.70	22.7 - 37.9	113.6
1¼	1.660	—	—	—	0.87	10.0 - 15.0	48.0	0.87	10.0 - 15.0	48.0
32	42.4	—	—	—	3.29	37.9 - 56.8	181.7	3.29	37.9 - 56.8	181.7
1½	1.900	—	—	—	1.30	15.0 - 20.0	66.0	1.30	15.0 - 20.0	66.0
40	48.3	—	—	—	4.92	56.8 - 75.7	249.8	4.92	56.8 - 75.7	249.8
2	2.375	—	—	—	2.00	20.0 - 36.0	110.0	2.00	20.0 - 36.0	110.0
50	60.3	—	—	—	7.57	75.7 - 136.3	416.4	7.57	75.7 - 136.3	416.4

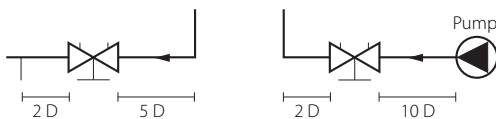
### IMPORTANT NOTES:

Balancing valves should be sized in relation to the GPM flows (and not in relation to pipeline size). **Balancing valves should never be sized based on the maximum or minimum flow rates. They should be sized using the nominal flow rate only.** The Minimum Flow is calculated from the minimum open setting of the valve and a minimum pressure drop 1 Ft. WG (= 3 kPa). The Nominal Flow is calculated from the maximum open setting of the valve and the minimum recommended pressure drop, 2 Ft. WG (= 6 kPa). The Maximum Flow is calculated from the maximum open setting of the valve and the maximum pressure drop, 20 Ft. WG (= 60 kPa). A computer program, TA-Select III, is available for calculation of pre-setting values and other applications.

**Note:** For information regarding Allen Wrench sizes see the Material Specifications section on page 2.

### MEASURING ACCURACY:

The hand wheel zero position is calibrated and must not be changed. Valves have an accuracy of flow measurement of 2% to 3% when used within their recommended flow range and installed in accordance with the figure below.\* For the most accurate results, a Series 737 TA CBI-II should be used. However, any differential pressure meter may be used.

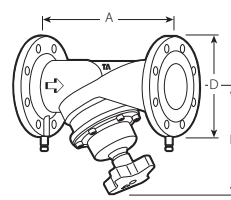


The illustration above relates to differential pressure measurement accuracy and is not an installation requirement.

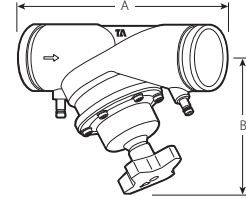
# Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

## Balancing Valve

**SERIES 788** Flanged End  
(Class 150 RF, ASME/ANSI B16.42)  
**SERIES 789** Grooved End



**SERIES 788**  
TYPICAL 2½ – 12”/65 – 300MM SIZES



**SERIES 789**  
TYPICAL 2½ – 12”/65 – 300MM SIZES

Size		Series 788 Flange End (250psi/1720kPa) Balancing Valve			Series 789 Groove End (350psi/2400kPa) Balancing Valve		
Nominal Size Inches mm	Actual Outside Dia. Inches mm	A End to End Inches mm	B Height Inches mm	Approx. Weight Each Lbs. kg	A End to End Inches mm	B Height Inches mm	Approx. Weight Each Lbs. kg
2½ 65	2.875 73.0	11.38 289	8.00 203	24.0 10.9	11.38 289	8.00 203	14.0 6.4
3 80	3.500 88.9	12.25 311	8.63 219	31.0 14.1	12.25 311	8.63 219	20.0 9.1
4 100	4.500 114.3	13.75 350	9.44 240	43.0 19.6	13.75 350	9.44 240	31.0 14.1
5 125	5.563 141.3	15.75 400	10.88 276	62.0 28.5	15.75 400	10.88 276	50.0 22.7
6 150	6.625 168.3	18.88 480	11.25 286	82.0 37.5	18.88 480	11.25 286	69.0 31.3
8 200	8.625 219.1	23.63 600	17.00 432	168.0 76.5	23.63 600	17.00 432	140.0 63.7
10 250	10.750 273.0	28.75 730	17.75 451	270.0 122.9	28.75 730	17.75 451	202.0 91.9
12 300	12.750 323.9	33.50 851	19.00 483	360.0 163.9	33.50 851	19.00 483	280.0 127.4

### VALVE SELECTION GUIDE

Size		Series 788 Flange End (250psi/1720kPa) Balancing Valve			Series 789 Groove End (350psi/2400kPa) Balancing Valve		
Nominal Size Inches mm	Actual Outside Dia. Inches mm	Minimum Flow GPM LPM	Nominal Range of Flow GPM LPM	Maximum Flow GPM LPM	Minimum Flow GPM LPM	Nominal Range of Flow GPM LPM	Maximum Flow GPM LPM
2½ 65	2.875 73.0	1.40 5.30	36.0 – 100.0 136.3 – 378.5	290.0 1097.7	1.40 5.30	36.0 – 100.0 136.3 – 378.5	290.0 1097.7
3 80	3.500 88.9	1.50 5.68	100.0 – 130.0 378.5 – 492.1	410.0 1551.9	1.50 5.68	100.0 – 130.0 378.5 – 492.1	410.0 1551.9
4 100	4.500 114.3	1.90 7.19	130.0 – 200.0 492.1 – 757.0	650.0 2460.3	1.90 7.19	130.0 – 200.0 492.1 – 757.0	650.0 2460.3
5 125	5.563 141.3	4.20 15.90	200.0 – 320.0 757.0 – 1211.2	1020.0 3860.7	4.20 15.90	200.0 – 320.0 757.0 – 1211.2	1020.0 3860.7
6 150	6.625 168.3	5.00 18.93	320.0 – 450.0 1211.2 – 1703.3	1430.0 5412.6	5.00 18.93	320.0 – 450.0 1211.2 – 1703.3	1430.0 5412.6
8 200	8.625 219.1	30.00 113.55	450.0 – 820.0 1703.3 – 3103.7	2600.0 9841.0	30.00 113.55	450.0 – 820.0 1703.3 – 3103.7	2600.0 9841.0
10 250	10.750 273.0	70.00 264.95	800.0 – 1300.0 3028.0 – 4920.5	4040.0 15291.4	70.00 264.95	800.0 – 1300.0 3028.0 – 4920.5	4040.0 15291.4
12 300	12.750 323.9	115.00 435.28	1300.0 – 1500.0 4920.5 – 5677.5	4950.0 18735.8	115.00 435.28	1300.0 – 1500.0 4920.5 – 5677.5	4950.0 18735.8

### IMPORTANT NOTES: (SEE PREVIOUS PAGE FOR MEASURING ACCURACY)

Balancing valves should be sized in relation to the GPM flows (and not in relation to pipeline size). **Balancing valves should never be sized based on the maximum or minimum flow rates. They should be sized using the nominal flow rate only.** The Minimum Flow is calculated from the minimum open setting of the valve and a minimum pressure drop 1 Ft. WG (= 3 kPa). The Nominal Flow is calculated from the maximum open setting of the valve and the minimum recommended pressure drop, 2 Ft. WG (= 6 kPa). The Maximum Flow is calculated from the maximum open setting of the valve and the maximum pressure drop, 20 Ft. WG (= 60 kPa). A computer program, TA-Select III, is available for calculation of pre-setting values and other applications.

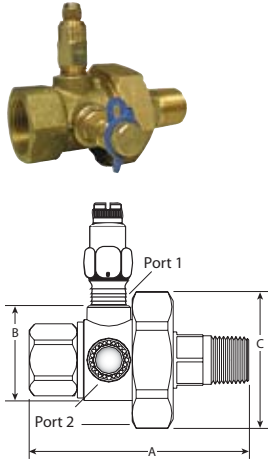
\*For the most accurate results, a Series 737 TA CBI-II should be used. However, any differential pressure meter may be used.

**Note:** For information regarding Allen Wrench sizes see the Material Specifications section on page 2.

# Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

## Koil-Kit Components

**SERIES 78U** Union Port Fitting  
 ½"/15mm through 2"/50mm Sizes



The TA Series 78U Union Port Fitting provides a simplified, quality terminal hookup for installation at coil outlet. The Series 78U features a port section equipped standard with a manual air vent port on top allowing for optimal positioning at coil outlet and effective venting together with a pressure/temperature port on the side. The Series 78U is equipped with an EPDM o-ring.

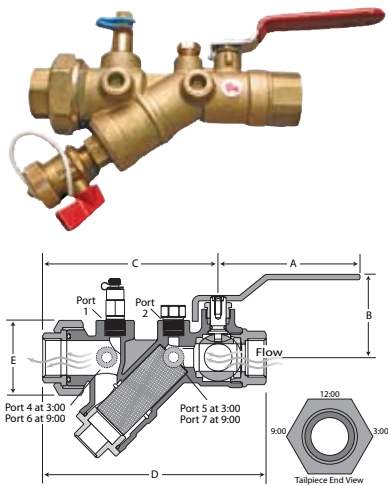
Rated up to 400psi/2758kPa and 250°F/121°C.

Inlet Nominal Size Inches/mm	Outlet Nominal Size Inches/mm	A Inches mm	B Inches mm	C Inches mm	Approx. Weight Each Lbs. kg
½ 15	½ 15	3.5 89	0.8 19	1.6 39	0.6 0.28
¾ 20	½ 15	3.7 94	0.9 23	2.2 56	1.0 0.45
1 25	¾ 20	4.1 104	1.0 25	2.4 60	1.2 0.56
1¼ 32	1 25	4.3 109	1.2 30	2.9 74	2.8 1.28
1½ 40	1¼ 32	4.4 112	1.3 32	3.5 88	3.5 1.57
2 50	1½ 40	4.6 116	1.7 43	3.9 99	5.9 2.66

**NOTES**

Dimensions based on F x M connections and will vary with mixed connections. All weights and dimensions are subject to minor changes.

**SERIES 78Y** Strainer/Ball Valve Combination  
 ½"/15 mm through 2"/50 mm Sizes



The TA Series 78Y Strainer/Ball Valve Combination provides a simplified, quality terminal hookup that protects both coil and modulating valve from pipe scale, sand or weld slag. The Series 78Y features a 20 grid stainless steel strainer (removable without breaking the line), a blow-out proof valve stem, Teflon® packing, plated ball and a strainer-blowdown & drain valve with hose thread, cap & retainer. Equipped standard with a pressure/temperature port and extra plugged port on top with a union end.

Rated up to 400psi/2758kPa and 250°F/121°C.

Nominal Size Inches mm	A Inches mm	B Inches mm	C Inches mm	D Inches mm	E Inches mm	F Inches mm	Approx. Weight Each Lbs. kg	C <sub>v</sub> /K <sub>v</sub>
½ 15	3.9 99	2.0 51	4.8 122	6.2 157	2.1 53	2.1 53	2.0 0.91	7.8 6.7
¾ 20	3.9 99	2.0 51	4.8 122	6.2 157	2.1 53	2.1 53	2.0 0.95	8.8 7.6
1 25	3.9 99	2.0 51	4.8 122	6.2 157	2.1 53	2.1 53	2.0 0.95	8.8 7.6
1* 25	4.7 119	2.6 66	6.8 173	8.6 218	2.8 71	2.4 61	4.5 2.04	19.7 17.0
1¼ 32	4.7 119	2.6 66	6.8 173	8.6 218	2.8 71	2.4 61	4.6 2.09	20.4 17.6
1¼* 32	4.7 119	2.6 66	6.8 173	8.6 218	2.8 71	2.4 61	4.6 2.09	20.4 17.6
1½ 40	5.5 140	3.5 89	7.9 201	10.0 254	3.8 97	2.5 64	9.3 4.22	52.7 45.4
2 50	5.5 140	3.5 89	7.9 201	10.0 254	3.8 97	2.5 64	9.5 4.31	55.1 47.5

**NOTES**

Weights based on F x F connections and will vary with mixed options/connections.

Weights and dimensions are subject to minor changes.

\* Denotes female thread not available on union end

## Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components



### TA Link Differential Pressure Sensor

#### SERIES 736

- Provides connection between a building's heating and cooling circuits and building's monitoring system (BMS)
- Continuously measures the flow and differential pressure through and across the Tour & Andersson balancing valves
- Measurement probes provided for direct connection to the measurement points on all Series 786, 787, 788, and 789 circuit balancing valves



### TA Select III Computer Program

TA Select III helps you choose the right balancing valve, taking the desired flow rate and pressure drop into consideration. The software will advise the correct combination of valve, handwheel position and pipe size to correctly balance the system. A sophisticated viscosity correction procedure displays the density, viscosity, specific heat and freezing point of fluids such as glycols and brines. It also shows the true value of flows in the valves.

The program will also size the pipe, generate Cv values for the ATC valves and give pre-set information for all the TA valves on the project.



### Hand-held Computerized Balancing Instrument (CBI)

#### SERIES 737

- Series 737 CBI-II meter is a hand-held computer balancing instrument programmed for use with Tour & Andersson balancing valves to obtain direct reading of flow and differential pressures
- This instrument consists of an electronic differential pressure sensor and a microcomputer
- Measured values can be saved in the unit before transferring the information to a PC for printing out a commissioning report of for creating a permanent record
- Automatically adjusts correction factor for media other than water.



### TA CMI Pressure Differential Meter

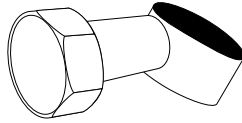
#### SERIES 73M

TA CMI is a computer programmed measuring instrument. It is a handheld instrument for measuring differential pressure, temperature and flow through balancing valves in hydronic systems. It consists of a sensor unit and an instrument unit that has been programmed with the TA valve characteristics, which makes it possible to take a direct reading of flow differential pressures.

# Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

## Drain Kit

SERIES 786-DK



- A separate drain kit with a 3/4"/20mm connection is available for Series 786 and Series 787 valves
- Kit must be field mounted
- Kit comes complete with 2 gaskets and a hexnut.
- Partcode= K-000-786-CBV

**Note:** For information regarding Allen Wrench sizes see the Material Specifications section on page 2.

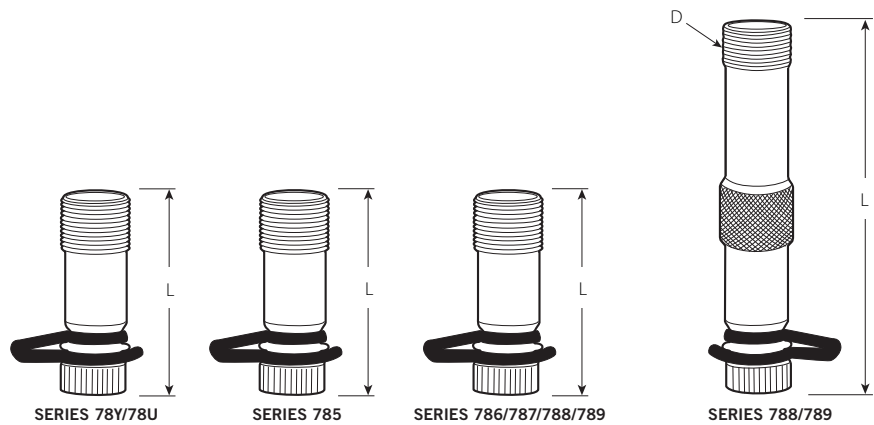
## HOSE END DRAIN VALVE For Series 78Y



- A separate drain kit with connection is available for the Series 78Y Strainer/ Ball Valve Combination sizes 1/2 – 2"/15 – 50mm
- Kit must be field mounted
- Part Code= P-004-78P-OHN

## Accessories

### PROBE PORT



Style	Size	Part Code	Dimension		Part Code	Dimension		Part Code	Dimension	
			L	L		L	D		L	D
	Inches/mm		Inches/mm	Inches/mm		Inches/mm	Inches/mm		Inches/mm	Inches/mm
78Y/78U	1/2 – 3/4 15 – 20	K-000-740-007	1.55 39	—	—	—	—	—	—	—
785	1/2 – 3/4 15 – 20	K-000-785-012	1.19 30	—	—	—	—	—	—	—
786/787	1/2 – 2 15 – 50	—	—	—	K-000-740-003	1.75 45	—	—	—	—
788/789	2 1/2 – 12 65 – 300	—	—	—	—	—	K-000-740-002	.38 10	1.19 30	—
788/789	2 1/2 – 12 65 – 300	—	—	—	—	—	K-000-740-001	.38 10	3.50 89	—

**Note:** For information regarding Allen Wrench sizes see the Material Specifications section on page 2.



## Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

### PORT EXTENDER

For use with probe ports on the Series 78Y & 78U



- The port extender is used to extend accessories to clear 2"/50mm insulation (M x F ¼" or ⅜").
- Extends probe port and air vent.
- Length= 1.425"/36mm
- Part Code= P-000-78P-EXT

### INSULATION EXTENSION

For Series 78Y



- Handle extension for use on chilled water to clear 2"/50mm insulation

Valve Size Inches/mm	Part Code
½ – ¾ 15 – 20	P-004-78P-HDL
1 – 1¼ 25 – 32	P-010-78P-HDL
1½ – 2 40 – 50	P-014-78P-HDL

### AIR VENT

For Series 78Y & 78U



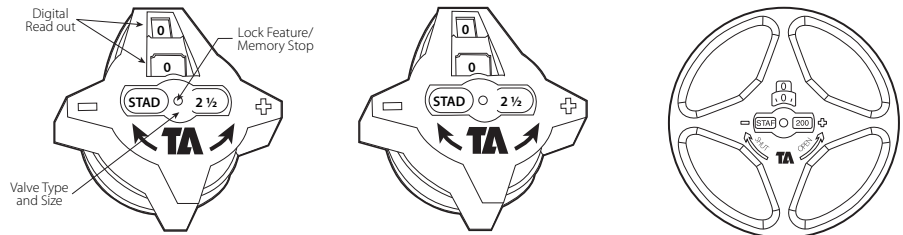
- Partcode= P-004-78P-OAV

### UNIVERSAL GAUGE METER CONVERSION KIT

- This kit includes 2 probes, necessary fittings, flow wheel and instruction sheet.
- Partcode= K-000-738-100

# Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

## HANDWHEELS



Part Code	Part Code	Part Code
P-004-784-001	P-024-784-001	P-080-784-001

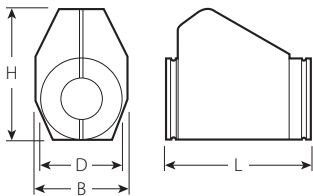
**Note:** For information regarding Allen Wrench sizes see the Material Specifications section on page 2.

## BALANCING WHEEL



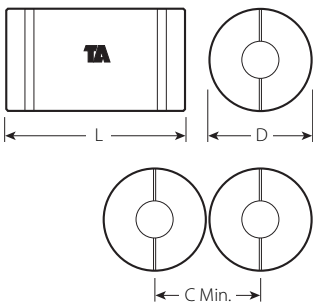
By using the balancing wheel it is easy to determine the relationship between flow, pressure drop and the handwheel setting values for all valve sizes. Order the balancing wheel from your nearest Victaulic representative.

## PREFAB INSULATION SERIES 786 & SERIES 787



Valve Size	Dimensions Inches/mm					
	In./mm	Part Code	H	D	B	L
1/2 & 3/4 15 & 20		K-004-784-INS	5.31 135	3.54 90	4.06 103	5.51 140
1 25		K-010-784-INS	5.59 142	3.70 94	4.06 103	6.30 160
1 1/4 32		K-012-784-INS	6.14 156	4.17 106	4.06 103	7.09 180
1 1/2 40		K-014-784-INS	6.65 169	4.25 108	4.45 113	8.43 214
2 50		K-020-784-INS	7.01 178	4.25 108	4.49 114	9.65 245

## PREFAB INSULATION SERIES 788 & SERIES 789



Valve Size	Dimensions Inches/mm				
	In./mm	Part Code	H	D	B
2 1/2 65		K-024-784-INS	17.75 451	10.63 270	10.63 270
3 80		K-030-784-INS	19.00 483	11.44 291	11.44 291
4 100		K-040-784-INS	20.50 521	12.63 321	12.63 321
5 125		K-050-784-INS	22.50 572	13.75 349	13.75 349
6 150		K-060-784-INS	26.00 660	15.00 381	15.00 381

## Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

### TYPICAL SPECIFICATIONS

All valves shall be of one manufacturer.

#### **SERIES 785 – (½ – ¾" SOLDER STYLE)**

Furnish and install, as shown on the plans, TA Hydronics (formerly known as Tour & Andersson) Solder Style Balancing valves with provision for connecting a portable Differential (Ft. of Head) Pressure meter. Each meter connection shall have pressure/temperature probes.

The TA Hydronics Series 785 TBV-S Balancing valves shall be Y-Pattern Globe Style design and all metal parts of nonferrous copper alloy. Each valve can be installed in any direction without affecting flow measurement and shall provide three (3) functions:

(1) Precise flow measurement, (2) Precision flow balancing, (3) Positive shut-off with no drip seat.

The Series 785 TBV-S valves shall have one (1) 360° adjustment turn of handwheel with memory feature for use with positive shut-off, and locking feature for tamperproof setting. The handwheel can be installed in any position without affecting performance.

All valves shall be of one manufacturer.

#### **SERIES 786 – (½ – 2" SOLDER WITH DIGITAL HANDWHEEL)**

#### **SERIES 787 – (½ – 2" NPT)**

Furnish and install, as shown on the job plans, Tour & Andersson Series 786/787 Circuit Balancing Valves with provision for connecting a portable differential (Ft. of Head) pressure meter. Each meter connection shall have pressure/temperature probes.

The balancing valves shall be Y-pattern globe style design and all metal parts of nonferrous, pressure die cast, nonporous Ametal. Each valve shall provide four (4) functions:

(1) Precise flow measurement, (2) Precision flow balancing, (3) Positive shut-off with no drip seat, eliminating the need of an additional isolation valve, (4) Drain connection using ¾" NPT hose end thread.

These valves shall have four (4) 360° adjustment turns of the handwheel for precise setting with hidden memory to provide a tamper-proof balancing setting. Handwheel shall have digital readout. The handwheel can be installed in any position without affecting performance.

#### **SERIES 788/789 – (2 ½ – 12" FLANGED AND GROOVED WITH DIGITAL HANDWHEEL)**

Furnish and install, as shown on the job plans, Tour & Andersson Series 788/789 Circuit Balancing valves with provision for connecting a portable differential (Ft. of Head) pressure meter. Each meter connection shall have pressure/temperature probes.

The valancing valves shall be Y-pattern globe style design with ductile iron body all other wetted parts of nonferrous, pressure die cast Ametal. Each valve shall provide three (3) functions:

(1) Precision flow measurement, (2) Precision flow balancing, (3) Shut-off feature, eliminating the need of an additional isolation valve.

These valves shall have eight (8), twelve (12) or sixteen (16) 360° adjustment turns of the handwheel for precise setting with hidden memory feature to program the valve with precision tamper-proof balancing setting. Handwheel shall have digital readout. The handwheel can be installed in any position without affecting performance.

## Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

### TYPICAL SPECIFICATIONS

**Koil-Kit packages for ½" through 2":** Shall include the following three components: 78U, 78Y and Tour and Andersson balancing valve sized to flow, all components shall be from one manufacturer, Victaulic/Tour and Andersson.

**TA Series 78U Union Port Fitting ½" through 2":** 400 psi/2758 kPa maximum CWP, Sweat/Soldered or FPT threaded x Union ends, forged brass body with manual air vent port and pressure/temperature port, with EPDM seals. Union port fitting shall provide a simplified terminal hookup for installation at coil outlets. Suitable for operating temperatures to 250°F/120°C.

**TA Series 78Y Strainer/Ball Valve Combination ½" through 2":** 400 psi/2758 kPa maximum CWP, Sweat/Soldered ends or FPT threaded x FPT Union ends, Ametal copper alloy body consisting of a full port ball valve and strainer with flow measuring ports. Ball valve shall be complete with Teflon packing, plated ball, blow-out proof stem, and steel handle with vinyl grip. Strainer shall be Y-pattern, with 20 mesh stainless steel screen and blowdown port. Strainer/ball combination shall provide a simplified hookup to protect the coil and modulating valve. Suitable for operating temperatures to 250°F/120°C.

**TA Circuit Balancing Valves ½" through 2":** 300 psi/2065 kPa, y-pattern, globe type with soldered or threaded ends, non-ferrous Ametal® brass copper alloy body, EPDM o-ring seals. 4-turn digital readout handwheel for balancing, hidden memory feature with locking tamper-proof setting, and connections for portable differential meter. TA Hydraulics Series 786 STAS or 787 STAD.

**TA Circuit Balancing Valves 2 ½" through 12":** 300 psi/2065 kPa, y-pattern, globe type with flanged or grooved ends, ASTM A536 ductile iron body, all other metal parts of Ametal® brass copper alloy, EPDM O-ring seals. 8, 12 or 16-turn digital readout handwheel for balancing, hidden memory feature with locking tamper-proof setting, and connections for portable differential meter. TA Hydraulics Series 788 STAF or 789 STAG.

Purchased TA CBI-II or TA CMI balancing instruments are to be left with the project owner upon completion of the project.

#### INSULATION:

For insulation against heat loss or condensation. Preformed rigid polyurethane insulation is available for ½ – ¾" Series 785 valves, ½ – 2" Series 786/787 valves, and for 2 ½ – 6" Series 788/789 valves.

## Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

### CORRECTION FACTORS

For liquids other than water, the flow values from the balancing wheel can be adjusted as follows:

Divide the flow rate (as indicated by the balancing wheel) by the square root of the volume by weight (specific density  $q$ ).

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

This applies to liquids having, on the whole, the same viscosity as water, i.e. most water/glycol mixtures and water/brine solutions at room temperature. At low temperatures, the viscosity increases and laminar flow may occur in certain valves. The risk increases with small valves, low settings and low differential pressures.

A computer program (TA-Select III) is available for calculation of pre-setting values and other applications. When the flow setting is verified or changed to the final setting, the memory stop should be set. Contact Victaulic for further information.

### SIZING A BALANCING VALVE

When  $\Delta p$  and the design flow rate are known, use the formula shown to calculate the  $C_v$  value or use the graphs on page 16 – 18. The Tour & Andersson balancing wheel can also be used.

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

$q$  in GPM,  $\Delta p$  in Ft. of  $H_2O$

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

$q$  in GPM,  $\Delta p$  in psi

A computer program, TA-Select III, is available from Victaulic for calculation of pre-setting values and other applications.

# Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

## C<sub>v</sub> VALUES FOR VARIOUS HANDLE SETTINGS SERIES 785

The values below or the graph on page 16 may be used when calculating and sizing a piping system.

Size	C <sub>v</sub> Values for Handwheel Position listed below §										
Inches	0.5	1	2	3	4	5	6	7	8	9	10*
½	0.15	0.24	0.42	0.59	0.75	0.90	1.07	1.24	1.46	1.75	2.10
¾	0.28	0.43	0.71	1.01	1.30	1.61	1.93	2.30	2.71	3.34	4.20

§ C<sub>v</sub> = GPM at a ΔP of 1 psi/7 kPa) through the valve at any given setting.

1 psi = 2.31 ft. of H<sub>2</sub>O.

\*Full open valve.

## C<sub>v</sub> VALUES FOR VARIOUS HANDLE SETTINGS SERIES 786/787

The values below or the graph on page 16 may be used when calculating and sizing a piping system.

No. of Turns	C <sub>v</sub> Values for Sizes listed below §					
	½"	¾"	1"	1 ¼"	1 ½"	2"
0.50	0.15	0.59	0.70	1.32	2.03	2.97
1.00	0.25	0.88	1.19	2.20	3.83	4.87
1.50	0.36	1.38	2.44	3.60	5.34	8.35
2.00	0.66	2.20	4.20	5.40	7.08	13.60
2.50	1.02	3.24	6.15	8.24	10.20	18.80
3.00	1.60	4.49	8.00	11.00	14.60	24.90
3.50	2.30	5.51	9.28	13.70	18.60	30.70
4.00 *	2.92	6.61	10.09	16.50	22.30	38.00

§ C<sub>v</sub> = GPM at a ΔP of 1 psi/7 kPa) through the valve at any given setting.

1 psi = 2.31 ft. of H<sub>2</sub>O.

\*Full open valve.

## Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

### C<sub>v</sub> VALUES FOR VARIOUS HANDLE SETTINGS SERIES 788/789

The values below or the graph on page 17 and 18 may be used when calculating and sizing a piping system.

No. of Turns	C <sub>v</sub> Values for Sizes listed below §							
	2½"	3"	4"	5"	6"	8"	10"	12"
0.50	2.09	2.32	2.90	6.38	7.54	—	—	—
1.00	3.94	4.64	6.96	12.20	13.90	—	—	—
1.50	5.68	6.96	10.40	18.00	25.50	—	—	—
2.00	7.54	9.28	13.30	24.90	46.40	46.40	104.00	—
2.50	10.80	12.80	18.60	31.30	75.40	58.00	128.00	—
3.00	18.90	16.20	30.20	41.80	116.00	75.40	162.00	174.00
3.50	29.70	22.60	51.00	63.80	157.00	104.00	226.00	267.00
4.00	40.90	33.60	73.10	96.30	196.00	139.00	296.00	348.00
4.50	51.60	47.60	92.80	132.00	240.00	191.00	371.00	429.00
5.00	60.30	63.80	114.00	164.00	281.00	261.00	447.00	522.00
5.50	70.20	78.90	133.00	194.00	324.00	331.00	516.00	621.00
6.00	78.90	92.80	153.00	229.00	362.00	394.00	580.00	719.00
6.50	84.70	107.00	168.00	255.00	394.00	464.00	632.00	800.00
7.00	89.30	119.00	184.00	289.00	426.00	505.00	684.00	870.00
7.50	93.40	131.00	203.00	320.00	454.00	545.00	766.00	945.00
8.00	98.60 *	139.00 *	220.00 *	348.00 *	487.00 *	597.00	841.00	1032.00
9.00	—	—	—	—	—	690.00	951.00	1125.00
10.00	—	—	—	—	—	754.00	1090.00	1206.00
11.00	—	—	—	—	—	824.00	1218.00	1299.00
12.00	—	—	—	—	—	887.00 *	1375.00 *	1392.00
13.00	—	—	—	—	—	—	—	1531.00
14.00	—	—	—	—	—	—	—	1589.00
15.00	—	—	—	—	—	—	—	1624.00
16.00	—	—	—	—	—	—	—	1682.00 *

§ C<sub>v</sub> = GPM at a ΔP of 1 psi/7 kPa) through the valve at any given setting.

1 psi = 2.31 ft. of H<sub>2</sub>O.

\*Full open valve.

# Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

## Diagram

SERIES 785/786/787

This graph shows the pressure drop across the pressure test points of the valve.

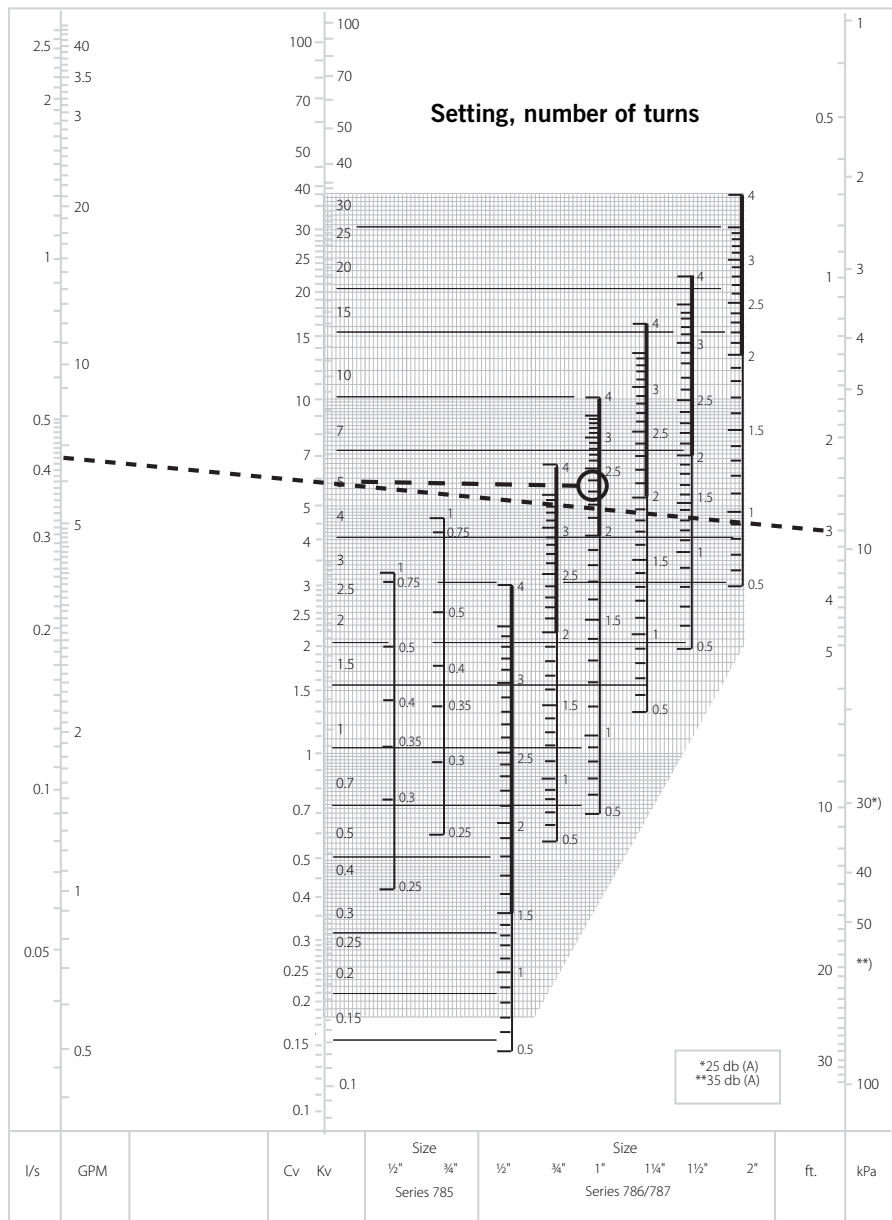
A straight line connecting the bars for flow rate,  $C_v$  and pressure drop shows the relationship between these variables. The position for each valve size is arrived at by drawing a horizontal line from the  $C_v$  value obtained.

**Example:**

Wanted: Pre-setting for a 1" valve at a desired flow rate of 6.7GPM and a pressure drop of 3 ft.

Solution: Draw straight line joining 6.7GPM and 3 ft. This gives  $C_v = 5.9$ . Now draw a horizontal line from  $C_v = 5.9$ . This intersects the bar for a 1" valve at the desired pre-setting of 2.35 turns.

**NOTE:** If the flow rate falls outside of the scale in the diagram, the reading can be made as follows: Starting with the example above, we get 3 ft.,  $C_v = 5.9$  and the flow rate 6.7GPM. At 3 ft. and  $C_v = .59$  we get the flow rate .67GPM. That is, for a given pressure drop, it is possible to read 10 times or 0.1 times the flow and  $C_v$  values.





# Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

## Diagram

**SERIES 788/789**  
**SIZES 2½ – 6"**

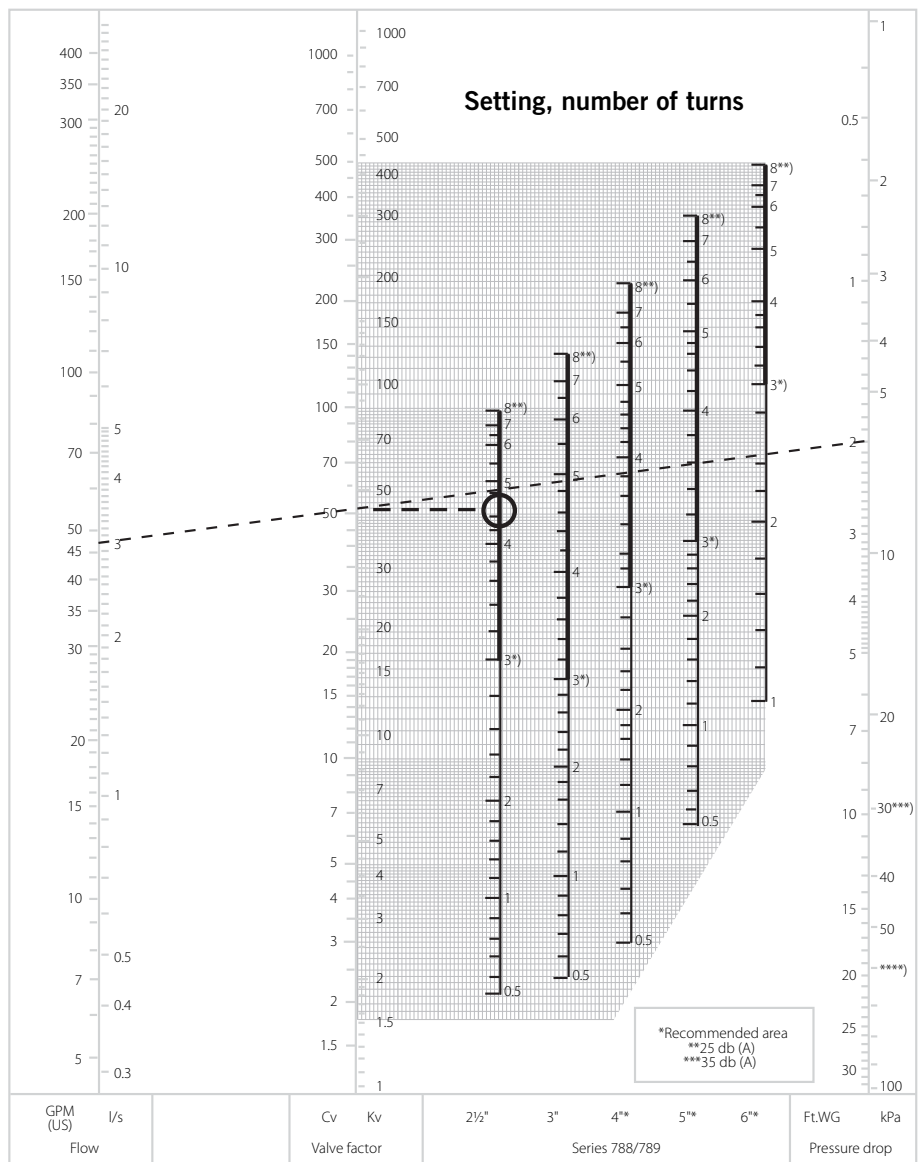
This graph shows the pressure drop across the pressure test points of the valve.

A straight line connecting the flow rate scale,  $C_v$  and pressure drop shows the relationship between these variables

**Example:**

Wanted: Pre-setting for a Series 788 or Series 789 2½" at a desired flow rate of 47 GPM and a pressure drop of 2 ft. WG.

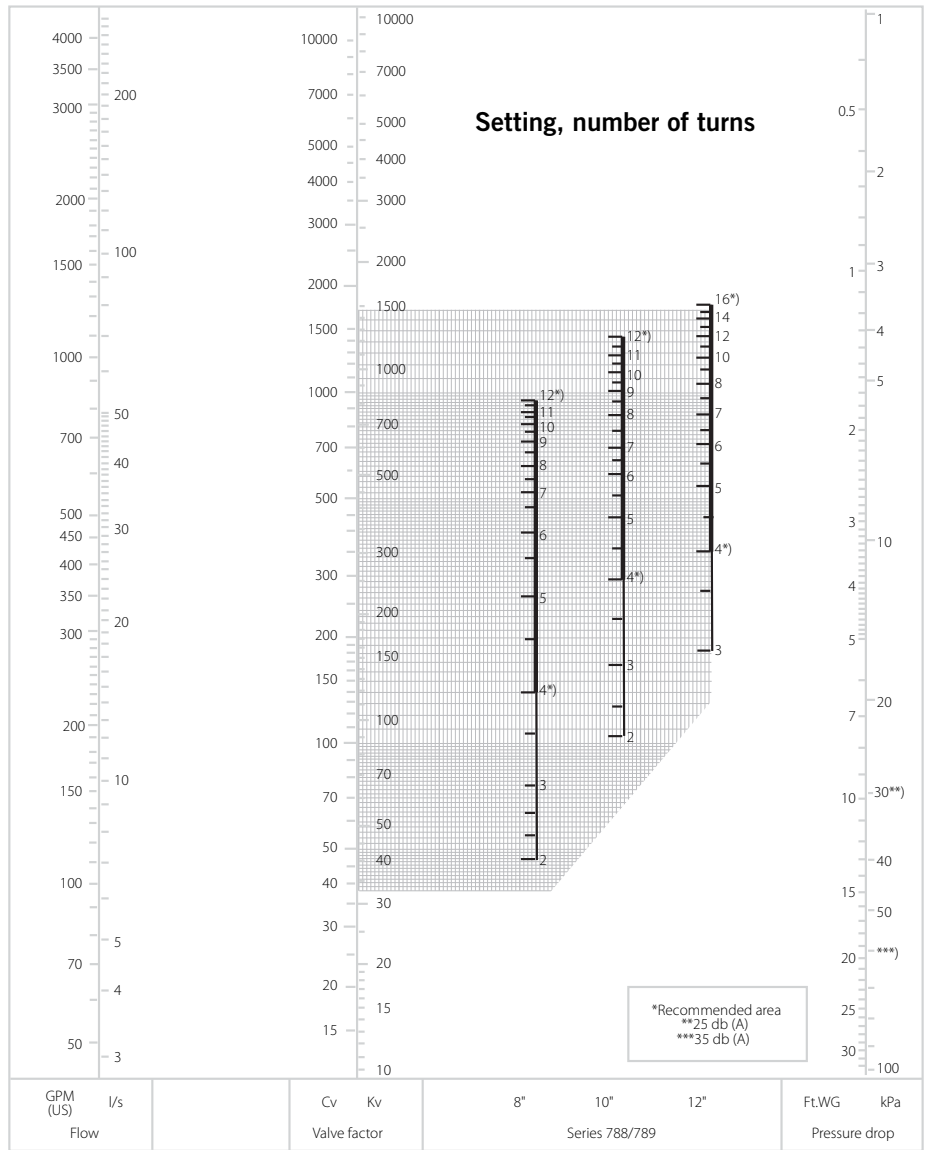
Solution: Draw straight line joining 47 GPM and 2 ft. WG. This gives  $C_v = 50$ . Now draw a horizontal line from  $C_v = 50$ . This intersects the flow rate scale for Series 788 2½" at the desired pre-setting of 4.5 turns.



# Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

## Diagram

**SERIES 788/789**  
**SIZES 8, 10 AND 12"**



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## Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

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## Tour & Andersson Circuit Balancing Valves and Koil-Kit™ Components

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**WARRANTY**

Refer to the Warranty section of the current Price List or contact Victaulic for details.

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**NOTE**

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions as recommended by Tour and Andersson. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.



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For complete contact information, visit [www.victaulic.com](http://www.victaulic.com)

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