



TECHNICAL DATA

**HOLE CUT SYSTEM
MODEL V-M21 & V-7721
MECHANICAL TEE
(FEMALE THREADED OUTLET)**

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

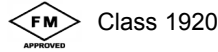
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

1. DESCRIPTION

VGS® Model V-M21 Mechanical Tees are available in sizes 2” through 6” and the Model V-7721 is available in 8” only. The Models V-M21 and V-7721 mechanical tees provide an easy take-out of a branch outlet without the need for welding. VGS® Mechanical Tees are manufactured at ISO9001 certified facilities and are designed to conform to ASTM and other standards where applicable. Threads are NPT per ANSI B1.20.1.

2. LISTINGS AND APPROVALS



The latest VGS® Technical Data can be accessed at <http://www.vikinggroupinc.com>. Scan to visit our Mobile website:  <http://vikinggroup.mobi/p/46374>

3. TECHNICAL DATA

Specifications:

Maximum working pressure: 300 psi (21 bar)

Ductile iron conforming to ASTM A536 Grade 65-45-12

Coating rust inhibiting paint - Orange RAL 2001

Hot dipped Zinc galvanized versions are available (conforming to ASTM A153); when ordering, add a “G” suffix to the Model number.

Rubber compound EPDM Grade E conforming to ASTM D2000, AWWA C606, NSF 61 and IAPMO.

Nuts and Bolts: Zinc plated, Carbon Steel conforming to ASTM A183 Grade 2 (UNC nuts and bolts are a silver chromate color and ISO are a gold chromate color)

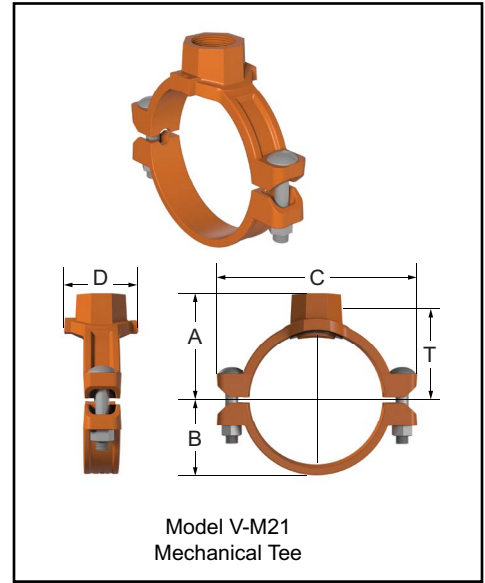


Table 1: V-M21 (2”–6”) and V-7721 (8” Only)

Nominal Size Run x Branch in (mm)	Hole Diameter* +0.13, -0 (+3.2, -0) in (mm)	Dimensions					Bolt Size in (mm)	Weight Lbs (Kgs)	Torque ft.-lbs (Nm)
		T** in (mm)	A in (mm)	B in (mm)	C in (mm)	D in (mm)			
2 x 0.5 (50 x 15)	1.5 (38)	2.26 (58)	2.5 (64)	1.5 (38)	4.56 (116)	3.19 (81)	3/8 X 2-1/8 (M10 X 55)	2.3 (1.04)	20-22 (27-30)
2 x 0.75 (50 x 20)	1.5 (38)	2.26 (58)	2.5 (64)	1.5 (38)	4.56 (116)	3.19 (81)	3/8 X 2-1/8 (M10 X 55)	2.4 (1.08)	
2 X 1 (50 X 25)	1.5 (38)	2.19 (56)	2.5 (64)	1.5 (38)	4.56 (116)	3.19 (81)	3/8 X 2-1/8 (M10 X 55)	2.4 (1.08)	
2 X 1.25 (50 X 32)	[1.75] [(45)]	2.48 (63)	2.87 (73)	1.5 (38)	4.56 (116)	3.31 (84)	3/8 X 2-1/8 (M10 X 55)	2.8 (1.27)	
2 X 1.5 (50 X 40)	[1.75] [(45)]	2.48 (63)	2.87 (73)	1.5 (38)	4.56 (116)	3.31 (84)	3/8 X 2-1/8 (M10 X 55)	3.0 (1.36)	
2.5 x 0.5 (65 x 15)	1.5 (38)	2.54 (64)	2.77 (70)	1.77 (45)	5.56 (141)	3.19 (81)	1/2 X 2-3/8 (M12 X 60)	3.0 (1.36)	45-50 (61-68)
2.5 x 0.75 (65 x 20)	1.5 (38)	2.54 (64)	2.77 (70)	1.77 (45)	5.56 (141)	3.19 (81)	1/2 X 2-3/8 (M12 X 60)	3.0 (1.36)	
2.5 X 1 (65 X 25)	1.5 (38)	2.44 (62)	2.75 (70)	1.77 (45)	5.56 (141)	3.19 (81)	1/2 X 2-3/8 (M12 X 60)	2.9 (1.32)	
2.5 X 1.25 (65 X 32)	2.0 (51)	2.61 (66)	3 (76)	1.77 (45)	5.56 (141)	3.54 (90)	1/2 X 2-3/8 (M12 X 60)	3.5 (1.59)	
2.5 X 1.5 (65 X 40)	2.0 (51)	2.61 (66)	3 (76)	1.77 (45)	5.56 (141)	3.54 (90)	1/2 X 2-3/8 (M12 X 60)	3.6 (1.63)	

*Hole diameters are suggested hole saw diameters. **T: Take-out (Center of run to end of pipe to be engaged)
Special attention is required to some exceptional hole sizes shown in [].

Table continues on page 2

	<h2 style="margin: 0;">TECHNICAL DATA</h2>	<h3 style="margin: 0;">HOLE CUT SYSTEM MODEL V-M21 & V-7721 MECHANICAL TEE (FEMALE THREADED OUTLET)</h3>
---	--	--

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

Continued from previous page.

Table 1: V-M21 (2"-6") and V-7721 (8" Only)									
Nominal Size Run x Branch in (mm)	Hole Diameter* +0.13, -0 (+3.2, -0) in (mm)	Dimensions					Bolt Size in (mm)	Weight Lbs (Kgs)	Torque ft.-lbs (Nm)
		T** in (mm)	A in (mm)	B in (mm)	C in (mm)	D in (mm)			
3 x 0.5 (80 x 15)	1.5 (38)	2.72 (69)	2.95 (75)	2.09 (53)	6.19 (157)	3.19 (81)	1/2 X 2-3/8 (M12 X 60)	3.3 (1.50)	45-50 (61-68)
3 x 0.75 (80 x 20)	1.5 (38)	2.72 (69)	2.95 (75)	2.09 (53)	6.19 (157)	3.19 (81)	1/2 X 2-3/8 (M12 X 60)	3.3 (1.50)	
3 X 1 (80 X 25)	1.5 (38)	2.76 (70)	3.07 (78)	2.09 (53)	6.19 (157)	3.19 (81)	1/2 X 2-3/8 (M12 X 60)	3.4 (1.54)	
3 X 1.25 (80 X 32)	2.0 (51)	3.11 (79)	3.5 (89)	2.09 (53)	6.19 (157)	3.7 (94)	1/2 X 2-3/8 (M12 X 60)	4.1 (1.86)	
3 X 1.5 (80 X 40)	2.0 (51)	3.11 (79)	3.5 (89)	2.09 (53)	6.19 (157)	3.7 (94)	1/2 X 2-3/8 (M12 X 60)	4.2 (1.91)	
3 X 2 (80 X 50)	2.5 (64)	3.07 (80)	3.5 (89)	2.09 (53)	6.19 (157)	4.25 (108)	1/2 X 2-3/8 (M12 X 60)	4.7 (2.13)	
4 x 0.5 (100 x 15)	1.5 (38)	3.45 (88)	3.69 (94)	2.64 (67)	7.19 (183)	3.13 (79)	1/2 X 3 (M12 X 75)	4.0 (1.81)	
4 x 0.75 (100 x 20)	1.5 (38)	3.45 (88)	3.69 (94)	2.64 (67)	7.19 (183)	3.13 (79)	1/2 X 3 (M12 X 75)	4.0 (1.81)	
4 X 1 (100 X 25)	1.5 (38)	3.37 (86)	3.69 (94)	2.64 (67)	7.19 (183)	3.13 (79)	1/2 X 3 (M12 X 75)	4.2 (1.91)	
4 X 1.25 (100 X 32)	2.0 (51)	3.23 (82)	3.63 (92)	2.64 (67)	7.19 (183)	4 (102)	1/2 X 3 (M12 X 75)	4.5 (2.04)	
4 X 1.5 (100 X 40)	2.0 (51)	3.61 (92)	4.00 (102)	2.64 (67)	7.19 (183)	4 (102)	1/2 X 3 (M12 X 75)	4.9 (2.22)	
4 X 2 (100 X 50)	2.5 (64)	3.57 (91)	4.00 (102)	2.64 (67)	7.19 (183)	4.06 (103)	1/2 X 3 (M12 X 75)	5.3 (2.4)	
4 X 2.5 (100 X 65)	2.75 (70)	3.45 (88)	4.00 (102)	2.64 (67)	7.19 (183)	4.44 (113)	1/2 X 3 (M12 X 75)	5.8 (2.63)	
4 X 3 (100 X 80)	3.5 (89)	3.39 (86)	4.13 (105)	2.64 (67)	7.19 (183)	5.06 (129)	1/2 X 3 (M12 X 75)	6.3 (2.86)	
5 X 2 (125 X 50)	2.5 (64)	4.15 (106)	4.59 (117)	3.2 (81)	8.82 (224)	4.02 (102)	5/8 X 3-1/2 (M16 X 90)	6.6 (2.99)	85-90 (115-122)
5 x 2.5 (125 x 65)	2.75 (70)	4.06 (103)	4.72 (120)	3.2 (81)	8.82 (224)	4.49 (114)	5/8 X 3-1/2 (M16 X 90)	7.4 (3.36)	
5 x 3 (125 x 80)	3.5 (89)	3.98 (101)	4.72 (120)	3.2 (81)	8.82 (224)	5.28 (134)	5/8 X 3-1/2 (M16 X 90)	8.2 (3.72)	
6 X 1.25 (150 X 32)	2.0 (51)	4.73 (120)	5.13 (130)	3.72 (95)	9.87 (251)	3.63 (92)	5/8 X 3-1/2 (M16 X 90)	6.9 (3.13)	
6 X 1.5 (150 X 40)	2.0 (51)	4.73 (120)	5.13 (130)	3.72 (95)	9.87 (251)	3.63 (92)	5/8 X 3-1/2 (M16 X 90)	7.0 (3.18)	
6 X 2 (150 X 50)	2.5 (64)	4.69 (119)	5.12 (130)	3.72 (95)	9.87 (251)	4.19 (106)	5/8 X 3-1/2 (M16 X 90)	7.5 (3.40)	
6 X 2.5 (150 X 65)	2.75 (70)	4.45 (113)	5.12 (130)	3.72 (95)	9.87 (251)	4.61 (117)	5/8 X 3-1/2 (M16 X 90)	8.1 (3.67)	
6 x 3 (150 x 80)	3.5 (89)	4.37 (111)	5.12 (130)	3.72 (95)	9.87 (251)	5.35 (136)	5/8 X 3-1/2 (M16 X 90)	8.7 (3.95)	
6 x 4 (150 x 100)	4.5 (114)	4.69 (119)	5.51 (140)	3.72 (95)	9.87 (251)	6.38 (162)	5/8 X 3-1/2 (M16 X 90)	11.7 (5.31)	
Model V-7721 Only									
8 x 2.0 (200 x 50)	2.75 (70)	6.10 (155)	6.54 (166)	5.02 (128)	12.87 (327)	4.57 (116)	3/4 X 4-3/4 (M20 X 120)	14.4 (6.53)	120-170 (163-230)
8 x 2.5 (200 x 65)	2.75 (70)	5.87 (149)	6.54 (166)	5.02 (128)	12.87 (327)	4.57 (116)	3/4 X 4-3/4 (M20 X 120)	15.6 (7.08)	

*Hole diameters are suggested hole saw diameters. **T: Take-out (Center of run to end of pipe to be engaged)

	TECHNICAL DATA	HOLE CUT SYSTEM MODEL V-M21 & V-7721 MECHANICAL TEE (FEMALE THREADED OUTLET)
---	-----------------------	---

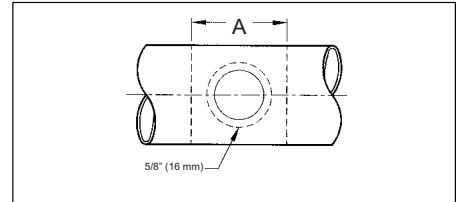
The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

4. HOLE CUTTING

The hole-cut method of pipe preparation is required when using mechanical tees, mechanical crosses, and saddle-lets. The method of pipe preparation requires the cutting or drilling of a specified hole size on the centerline of the pipe. Always use the correct hole saw size as shown this data sheet and never use a torch for cutting a hole. After the hole has been cut all rough edges must be removed and the area within 5/8" (16 mm) of the hole should be inspected to ensure a clean smooth surface, free of any indentations or projections that could affect proper gasket sealing. The area within the "A" dimension should also be inspected and must be free for dirt, scale or any imperfection that could affect proper seating or assembly of the fitting.

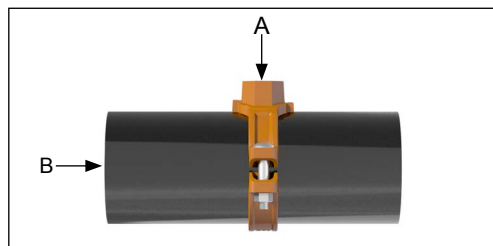


5. FLOW DATA

**Equivalent Length of Outlet Size Schedule 40 Carbon Steel Pipe
Per UL 213, Section 16
C=120**

Model	Nominal Inlet Size Inches	Nominal Outlet Size Inches	Equivalent Length Feet	C _v Values
V-M21	2	1	2	47
V-M21	2	1.25	4	67
V-M21	2	1.5	10	63
V-M21	2.5	1	2	47
V-M21	2.5	1.25	4	67
V-M21	2.5	1.5	10	63
V-M21	3	1.25	2	95
V-M21	3	1.5	6	81
V-M21	3	2	9	127
V-M21	4	1	4	33
V-M21	4	2	8	134
V-M21	4	2.5	12	183
V-M21	4	3	14	294
V-M21	5	2	8	134
V-M21	5	2.5	12	183
V-M21	5	3	14	294
V-M21	6	1.25	2	95
V-M21	6	1.5	4	100
V-M21	6	2	7	144
V-M21	6	2.5	11	191
V-M21	6	3	11	332
V-M21	6	4	18	479
V-7721	8	2	5	170
V-7721	8	2.5	8.2	221

Flow test data has shown that the total head loss between point A and B for the fittings can be expressed in terms of the pressure difference across the inlet and branch. The pressure difference can be obtained from the relationship below.



Formulas for Cv Values:

$$\Delta P = \frac{Q^2}{C_v^2}$$

$$Q = C_v \times \sqrt{\Delta P}$$

Where:

Q = Flow (GPM)

ΔP = Pressure Drop (psi)

C_v = Flow Coefficient