WINGROU®

GROOVED PIPING PRODUCTS

FIRE PROTECTION PIPING SOLUTIONS

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Refer to our Grooved Piping Products Handbook for detailed installation instructions

General Notes

Ductile iron was first invented in the U.S.A. and U.K. in the late 1940's. Superior strength was achieved by crystallizing graphite in the shape of nodules. The result was ductile iron that had tensile and yield strength properties that were equal to or greater than some steel castings. This superior strength combined with ductile irons excellent cast ability helped to reduce the weight and cost of many components. Because of these advantages and benefits, many components have been converted from gray iron, malleable iron and steel castings to ductile iron over the past 50 years

Ductile iron is an ideal material for grooved mechanical components, as it provides similar or greater strength to that of wrought or cast steel piping materials most Wingrou components are made of ductile iron conforming to ASTM A536 Gr. 65-45-12 and or ASTM A395 Gr. 65-45-15

ASTM A536, Grade 65-45-12

Requirements*	Minimum	Maximum
Carbon, %	3.0	3.9
Silicon, %	2.5	3.0
Manganese, %	0.1	0.4
Phosphorus, %		0.07
Sulfur, %		0.02
Magnesium, %	0.03	0.05
Chromium, %		0.1
Physical Properties		
Tensile strength, psi (MPa)	65,000 (448)	---
Yield strength, psi (MPa)	45,000 (310)	---
Elongation, %	12	---

*Reference only as chemical requirements are not specified in ASTM A536.

ASTM A395, Grade 65-45-15 (UNS F33100)

Chemical Requirements	Minimum	Maximum
Carbon, %	3.0	
Silicon, %		2.5
Manganese, %	Not specified	
Phosphorus, %		0.08
Sulfur, %	Not specified	
Magnesium, %	Not specified	
Chromium, %	Not specified	
Physical Properties		
Tensile strength, psi (MPa)	65,000 (448)	---
Yield strength, psi (MPa)	45,000 (310)	---
Elongation, %	15	---

Grooved Pipe Joining Technology

How does it work?

The groove is cold formed or machined into the pipe end using a grooving tool. The coupling housings, fully surrounding a gasket, are assembled around two grooved pipe ends, and the key sections of the housings engage into the grooves. The bolts and nuts are tightened with a socket wrench or impact wrench.

Types of grooved couplings

Flexible coupling – allows for controlled linear and angular movement, which accommodates pipeline deflection as well as thermal expansion and contraction.

Rigid coupling – does not allow for movement, similar to a flanged or welded joint.

1 Always read and understand all Wingrou products installation instructions before installing any Wingrou product. To avoid serious personal injury, wear safety glasses, hard hat and foot protection.

2. Always depressurize and drain the piping system before attempting disassembly, adjustment or removal of any piping components.

3. Designers must know and understand all relevant building and or piping standards, codes and specifications. It is the responsibility of the designer to select and or specify the appropriate product for the intended use and service.

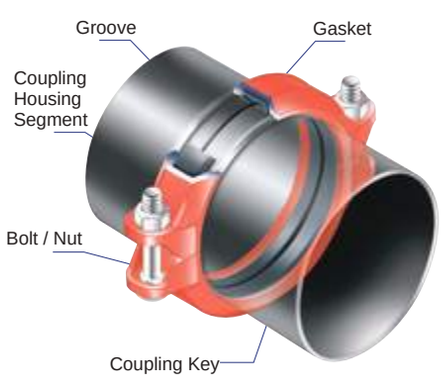
4. Always refer to the maximum pressure rating and service temperature range allowed for Wingrou products and ensure that they are used within these parameters.

5. Special attention is required for selection of suitable gasket grades for the intended service application.

6. All information and data contained herein supersede all previous published data. Wingrou reserves the right to change product designs and or specifications without notice and or obligation. Please refer to the Wingrou website for the latest information.

Typical Applications

HVAC	Air
Fire Protection	Desalination
Water Supply & Treatment	Mining & Tunnel Boring
Plumbing	Marine
Municipal	Gas
Food Processing	Chemical
Pulp & Paper	Oil
Agriculture	



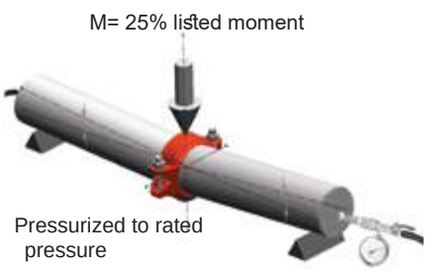
Rigid & Flexible Couplings

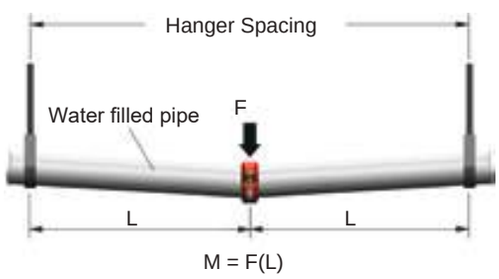
Grooved mechanical couplings are available in both rigid and flexible models. A rigid coupling is used in applications where a rigid joint is desired, similar to that of a traditional flanged, welded, and or threaded con nection. To be considered rigid, a coupling would allow less than one degree of deflection or angular movement

Definition : Grooved couplings are subjected to internal pressures and exterior bending forces during service. ASTM F1476- 07 defines a rigid coupling as a joint where there is essentially no available free angular or axial pipe movement and a flexible coupling as a joint wherein there is available limited angular and axial pipe movement.

Rigidity Proof Test : Rigidity proof testing is conducted by applying 25% of the listed mo ment to the test assembly which is internally pressurized to the rated pressure.

Bending Moment : Test bending moments are calculated by the equation M = F (L), where F is weight of water filled pipe (Lbs) and L is hanger spacing x 1/2 (feet). The table below shows test bending moments calculated using sch. 40 pipe with NFPA 13 hanger spacing.





Style 1N Flexible Coupling

Flexible couplings are designed to accommodate axial displacement, rotation and a minimum one degree of angular movement. Flexible couplings are used in applications that call for curved or deflected layouts and or when systems are exposed to outside forces beyond normal static conditions, such as seismic events or where vibration and or noise attenuation are a concern.

Test Bending Moment (ASTM F1476)

Nom. Size	Moment Nm	Moment Lbs-Ft
1½	549	405
2	780	575
2½	1200	885
3	1645	1213
4	2471	1823
5	3551	2619
6	4803	3543
8	7663	5652
10	11379	8393
12	15558	11475
14	18609	13725
16	24299	17922

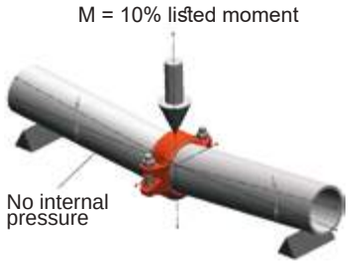
Rigid Coupling - Max. Deflection

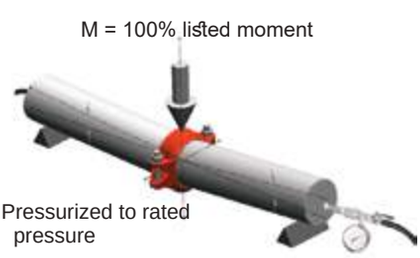
Nom. Size (inches)	θ, max (minutes)	θ, max. (degrees)
1½	57	0.95
2	56	0.93
2½	55	0.92
3	54	0.90
4	52	0.87
5	50	0.83
6	48	0.80
8	44	0.73
10	40	0.67
12	36	0.60
14	32	0.53
16	28	0.47

The rigid coupling shall pass the test when the angle has not changed more than angle θ. θ shall be calculated as follows: θ° 60(minutes) – [2' (minutes) x (nominal pipe size in inches)]. In other words, when θ is less than 1 degree (60 minutes), the grooved mechanical coupling is verified as a rigid coupling and when θ is more than 1 degree (60 minutes), the GMC is regarded as a coupling and when θ is more than 1 degree (60 minutes), the GMC is regarded as a coupling and when θ is more than 1 degree (60 minutes), the GMC is regarded as a flexible coupling. The maximum angles θ for rigid couplings are shown in the table below:

Flexibility Proof Test

Flexibility proof testing is conducted by applying a small bending moment, 10% of the listed moment, to the test assembly with no internal pressure. A 4" model 1N flexible coupling deflects 3 – 4 degrees depending on the type of groove processed.





NFPA 13 defines a FLEXIBLE COUPLING as;

"a listed coupling or fitting that allow axial displacement,

rotation, and at least 1 degree of angular movement of the pipe without inducing harm on the pipe. For pipe diameters of 8 in. and larger, the angular movement shall be permitted to be less than 1 degree but not less than 0.5 degrees." (NFPA 13-2007 3.5.4)
For sprinkler systems, NFPA 13 specifies the use of flexible couplings to protect the system against damage from earthquakes and sets some specific examples of how and where they should be used.

Designers and installers should design their fire protection systems in compliance with this standard.

Flexible Coupling

Axial Displacement & Angular Movement (Models IN & 1NH)

Size		Axial Displacement	Angular Movement Deflection	
Nom.Size mm/in	Actual OD mm/in	mm/in	Per coupling degrees	Per pipe mm/m, in/ ft
20	26.7	1.6	6°-46′	118
0.75	1.050	0.0625		1.42
25	33.4	1.6	5°-30′	96
1	1.315	0.0625		1.16
32	42.4	1.6	4°-20′	76
1.25	1.660	0.0625		0.91
40	48.3	1.6	3°-48′	66
1.5	1.900	0.0625		0.80
50	60.3	1.6	3°-01′	53
2	2.375	0.0625		0.63
65	73	1.6	2°-30′	44
2.5	2.875	0.0625		0.52
65	76.1	1.6	2°-24′	42
2.5	3.000	0.0625		0.50
80	88.9	1.6	2°-04′	36
3	3.500	0.0625		0.43
90	1016	1.6	1°-48′	31
3.5	4.000	0.0625		0.38
100	108.0	3.2	3°-24′	59.0
4	4.25	0.125		0.71
100	114.3	3.2	3°-12′	55
4	4.500	0.125		0.67
125	127.0	3.2	2°-53′	50.0
5	5.000	0.125		0.60
125	133	3.2	2°-46′	48
5	5.250	0.125		0.58
125	139.7	3.2	2°-37′	46
5	5.500	0.125		0.55
125	141.3	3.2	2°-36′	45
5	5.563	0.125		0.54

Size		Axial Displacement	Angular Movement (Deflection)	
Nom.Size mm/in	Actual OD mm/in	mm/in	Per coupling degrees	Per pipe mm/m, in/ft
150	159.0	3.2	2°-18′	40
6	6.250	0.125		0.48
150	165.1	3.2	2°-14′	39
6	6.500	0.125		0.47
150	168.3	3.2	2°-10′	38
6	6.625	0.125		0.45
200 JIS	216.3	3.2	1°-42′	30
8	8.516	0.125		0.36
200	219.1	3.2	1°-40′	29
8	8.625	0.125		0.35
250 JIS	267.4	3.2	1°-22′	24
10	10.528	0.125		0.29
250	273.0	3.2	1°-20′	23
10	10.750	0.125		0.28
300 JIS	318.5	3.2	1°-10′	20
12	12.539	0.125		0.25
300	323.9	3.2	1°-08′	20
12	12.750	0.125		0.24
350	355.6	3.2	1°-02′	18
14	14.000	0.125		0.22
400	406.4	3.2	0°-54′	16
16	16.000	0.125		0.19
450	457.0	3.2	0°-48′	14
18	18.000	0.125		0.17
500	508.0	3.2	0°-44′	13
20	20.000	0.125		0.15
550	559.0	3.2	0°-38′	11
22	22.000	0.125		0.13
600	610.0	3.2	0°-36′	10
24	24.000	0.125		0.13

Note:Axial displacement is the maximum value when the system is pressurized to the maximum working pressure. Angular movement is the maximum value that a coupling allows under no internal pressure.

Rubber Gasket

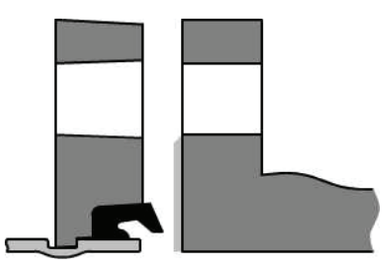
Wingrou gaskets are designed to provide life-of the-system service in a wide variety of applications. Gasket materials are available to meet most piping applications.

Couplings Gasket Type

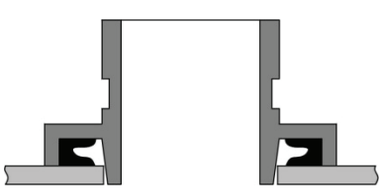
Standard C type:
Usually with grooved fittings. 1GS, 1X, 1N, 1NH, such as no special requirements are supporting this type of rubber seals

E type:
Usually with grooved fittings. 1GS, 1X, 1N, 1NH can be matched with this type of rubber seal

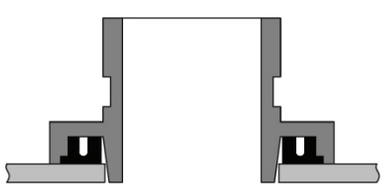
Reducing type :
Usually with grooved reducing fitting. 1NR supporting this type of rubber ring.



Flange type:
321-type slip flange are matched with this type of rubber ring



Opening reaction type:
3G, 3J are optional matching this type of rubber ring



Hole labyrinth type:
3G, 3J are optional matching this type of rubber ring

Rubber Gasket Materials

As elastomer technology advanced, superior gasket materials became available and were added to the Wingrou line. This allows Wingrou to presently offer a variety of synthetic rubber gaskets to provide the option of selecting Wingrou products for the widest variety of applications.
For most water system piping applications, Wingrou grade EPDM rubber is recommended. Wingrou E-grade rubber gasket material with excellent performance in anti-aging and heat resistance, the material at 125OC (257OF) temperature, the material for hot air aging test, the physical properties of the basic unchanged. When the rubber in a non-air environment, such as water piping system, its anti-aging properties will be further strengthened. Since water has no deteriorating effect on the elastomer, temperature is the only limiting factor to be considered in determining the life expectancy of the elastomer in water service. The superior performance of the Grade “E” elastomer permits its use for hot water service up to +230°F/ +110°C. The Grade “E” gasket is superior to previous gasket materials by all performance barometers, including high and low temperature limits, tensile strength, chemical resistance and shelf life

Rubber Gasket Data

To assure the maximum life for the service intended, proper gasket selection and specification in ordering is essential. Many factors must be considered in determining the optimum gasket for a specific service. The foremost consideration is temperature, along with concentration of product, duration of service and continuity of service. Temperatures beyond the recommended limits have a degrading effect on the polymer. Therefore, there is a direct relationship between temperature, continuity of service and gasket life. Services listed are General Service Recommendations only. It should be noted that there are services for which these gaskets are not recommended. For a list of application-specific and non-recommended application recommendations, reference should be made to the latest selection guide for seals.
The use of gasket only for the selection of rubber materials in the product, does not involve the selection of metal shell, fittings and bolts and nuts. For the housing, accessories and bolts and nuts selection, should be selected according to the actual application environment

Rubber Gasket Selecton Guide

Grade	Temperature Range	Rubber Compound	Color Code	General Service Recomm endations
E	-30°F to +230°F -34°C to +110°C	EPDM	Green Stripe	Recommended for hot water service within the specified emperature range plus a variety of dilute acids, oil-free air and many chemical services. UL classified in a cordance with ANSI/NSF 61 for cold +86°F/ +30°C and hot +180°F/+82°C potable water service. NOT RECOMMENDED FOR PETROLEUM SERVICES.
T	-20°F to+180°F -29°C to +82°C	Nitrile	Orange Stripe	Recommended for petroleum products, hydrocarbons, air with oil vapors, vegetable and mineral oils within the specified emperature range; except hot dry air over +140°F/+60°C and water over +150°F/+66°C. NOT RECOMMENDED FOR HOT WATER SERVICES
O	-20°F to +300°F -29°C to +149°C	Fluoroelastomer	Blue Stripe	Recommended for many oxidizing acids, petroleum oils, halogenated hydrocarbons, lubricants, hydraulic fluid , organic liquids and air with hydrocarbons to +300°F/+149°C
L	-30°F to +350°F -34°C to +177°C	Silicone	Body White	Recommended for dry heat, air without hydrocarbons to +350°F/ +177°C and certain chemical services.
V	-30°F to +180°F -34°C to +82°C	Neoprene	Yellow Stripe	Recommended for hot lubricating oils and certain chemicals. Good oxidation

Warning

To ensure that the rubber seal in the application of the longest life expectancy, the correct choice when ordering rubber seal material and specifictions are the most basic requirements. Failure to select the right rubber seal material can result in personal injury or property damage, joint leakage, or connection failure.

Data Chart Notes

Nominal Size mm/in	Pipe O.D. mm/in	Max.Working Pressure Bar/PSI	Max.End Load kN/Lbs	Axial Displacement mm/in	Angular Movement		Dimensions			Bolt Size in	Bolt Torque N-m/Lbs-Ft
					Degree Per Coupling(°)	Pipe mm/m in/ ft	X mm/in	Y mm/in	Z mm/in		
1	2	3	4	5	6		7			8	9

01.Nominal Size:
Wingrou couplings and fittings are identified by the nominal IPS pipe size in inches or nominal diameter of pipe (DN) in millimeters. Refer to the chart on the next page which shows a comparison between typical metric and IPS pipe sizes

02. Pipe O.D.:
Actual outside diameter of pipe in inches and millimeters.

03. Maximum Working Pressure (CWP):
Maximum working pressures listed are CWP (cold water pressure) or maximum allowed working pressure within the service temperature range of the gasket used in the coupling, based on standard wall or sch. 40 steel pipe, cut or roll-grooved to ANSI/AWWA C606 (latest edition) specifications and tested to ASTM F1476. Burst test pressures are minimum 3 times the maximum working pressures unless otherwise specified.
These ratings may occasionally differ from maximum working pressures listed and/or approved by UL, ULC, and/or FM as testing conditions and test pipes differ. For performance data on other pipe schedules contact Wingrou.

Note: For one time field test only the maximum joint working pressure may be increased 1½ times the figures shown.

04. Maximum End Load:
Maximum end loads listed are total of internal and external forces to which the joint can be subjected, based on standard wall or sch. 40 steel pipe, cut or roll-grooved to ANSI/AWWA C606 (latest edition) specifications.

Nominal Size / Pipe O.D.

While Wingrou fittings are normally identified by the nominal size, always check the actual O.D. of the pipe and fittings to be connected, as in some markets it is customary to refer to different O.D. pipes with the same nominal size. For example: The nominal size 65 (2½") is referred to 73.0 mm (2.875") pipe O.D. in IPS and 76.1 mm (3.000") pipe O.D. in BS, ISO or JIS pipes. Refer to pipe & tubing standards for details.

05. Axial Displacement:
Designed range of the gap between pipe ends based on roll grooved pipe.

06. Angular Movement (Deflection):
Allowable Axial Displacement and Angular Movement (deflection) figures are for roll grooved standard steel pipe. Values for cut grooved pipe will be double that of roll grooved. These values are maximums; for design and installation purposes these figures should be reduced by: 50% for ¾"/DN20 – 3½"/DN90; 25% for 4"/DN100 and larger to compensate for jobsite conditions. Maximum allowable deflection of pipe from centerline when the joint is used with cut or roll-grooved steel pipe under no internal pressure.

07. Dimensions:
"X", "Y", "Z" and so on are external dimensions for reference purpose only in inches and millimeters.

08. Bolt Size:
UNC bolt size and length in inches and ISO metric bolt size and length in millimeters with numbers of bolts where applicable.

09. Bolt Torque:
Recommended bolt fastening torque in Nm and Lbs-F

10. Weight:
Weight of a coupling complete with gasket, bolts and nuts or of a fitting in kilograms and pounds.

GENERAL CODES, STANDARDS, SPECIFICATIONS, ASSOCIATIONS & APPROVAL BODIES

AFSA) American Fire Sprinkler Association
(CASA) Canadian Automatic Sprinkler Association
(FM) Factory Mutual Research Corp.
(UL) Underwriter's Laboratories, Inc
(ULC) Underwriter's Laboratories of Canada
(NFPA) National Fire Protection Association NFPA 13
(NFSA) National Fire Sprinkler Association, Inc.
(ANSI) American National Standards Institute B36.10 & B36.19
(AWWA) American Water Works Association
(API) American Petroleum Institute API 5L
(ASTM) American Society of Testing and Materials A135, A795 & B88 (BS) British Standards BS1387, BS3600, BS3601 & BS3605
(ISO) International Standard Organization 65 & 4200
(JIS) Japan Industrial Standard G3452 & G3459
(FESC) Japan Fire Equipment Safety Center
(CSA) Canadian Standards Association B-242
(NYPA) New York Power Authority

HOUSING

Wingrou Coupling Housings are made of Ductile Iron confirming to ASTM A 536 Gr. 65-45-12
Ductile iron is an ideal material for grooved mechanical components, as it provides similar or greater strength to that of wrought or cast steel materials

Chemical Properties

Percent (%)	Carbon C	Silicon Si	Manganese Mn	Phosphorous P	Sulphur S	Magnesium Mg	Chromium Cr
Min - Max	3% - 3.9%	2.5% - 3.2%	0.1% - 0.4%	0% - 0.07%	0% - 0.03%	0.03% - 0.06%	0% - 0.1%

Physical Properties

Minimum Tensile Strength	Minimum Yield Strength	Minimum Elongation (%)
448 MPa	310 MPa	12
65,000 PSI	45,000 PSI	12

GASKETS

Wingrou Gaskets are made with EPDM rubber compound confirming to ASTM D2000 with properties equal or greater to required as per AWWA C606.
EPDM gaskets are suitable for water, waste water, sea water and deionized water.
EPDM gaskets are not suitable for petroleum based oils, fuels and hydrocarbon solvents.

Green Stripe
Grade "E"

Physical Properties

Material	Colour Code	Shore Hardness	Maximum Specific Gravity	Maximum Ash Content	Minimum Tensile Strength	Minimum Elongation %	Minimum Heat Aging Test
EPDM	Green Mark	65 ± 5	1.1%	5%	10.34 MPa 1500 PSI	300%	136°C for 168 Hrs. 277°F for 168 Hrs

BOLTS AND NUTS

Ovel neck track bolt confirming to ASTM A183 with minimum tensile strength of 110,000 psi or square neck carriage bolt to ASTM A446 with 120,000 psi minimum tensile strength permits tightening of the nuts from one side with a single wrench. Nuts conform to ASTM A194, Bot and Nuts are electro galvanized.

Chemical & Physical Properties of Bolts

Carbon C	Phosphorous P	Sulphur S	Chromium Cr	Tensile Strength	Yield Strength	Elongation %
0.3% Min.	0.05% Max	0.06% Max	0% - 0.1%	760 MPa 110,000 PSI	550 Mpa 80,000 PSI	12% Min.

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Wingrou products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Wingrou performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recom-mendation, advice, or opinion from any Wingrou employee, shall be deemed to alter, vary, supersede, or waive any provision of Allied Rubber and Gasket Company's standard conditions of sale, installation guide, or this disclaimer

INSTALLATION INSTRUCTIONS:

01. Remove one nut and bolt from housing loosen the other nu until it is flush with the end of the bolt. Remove the gasket from the housing.

02. Check suitability of gasket for intended service and apply a thin coat of silicone or other compatible pipe lubricant to gasket lips and outside of the gasket, if the gasket surface does not have lubricity

03. Insert ans push the gasket over one of the grooved ends of the two pipes to be loined. Gasket lip should not overhang pipe end.

04. Align and bring the pipes end together and side gasket into position entered between the grooves on each pipe. Gasket should should not extend into groove on either pipe.

FM APPROVED

c UL us LISTED

05. Place housings over gasket and apply pressure by hands to engage the keys into the grooves. Insert bolt and apply nuts finger tight. Make sure on Style 1GS the tonge and groove match to avoid product failure.

06. Tighten nuts alternately and equally until housing bolts pads are firmly together metal-to-metal. Uneven tightening will pinch the gasket. On style 1GS there may be slight gap at bolt pads.

WARNING: Depressurize and drain the piping system before attempting to install, remove, or adjust any piping products. Wear safety glasses, hardhat, and foot protection.

Torque Value

When a torque value is specified or coupling installation, this torque must be applied to the nuts in order to achieve proper installation, however torque beyond specified values will not improve sealing. Exceeding the specified torque by more than 25% may cause damage to the product, resulting in pipe-joint failure.

SPECIFIED TORQUE (LB/FT.)

SIZE	MIN	MAX
1”	30	45
1-1/4”	30	45
1-1/2”	30	45
2”	80	100
2-1/2”	80	100
3”	80	100
3-1/2”	100	130
4”	100	130

Helpful Information to Ensure Proper Assembly

Some couplings and components require the housing bolt pads to make metal-to-metal contact for proper assembly, while others require a specific bolt torque while maintaining equal bolt pad gaps. The icons and information below will help to identify those items to ensure proper assembly. Read and follow all installation instructions for the component being installed. Metal-to-metal contact: Tighten bolts and nuts until bolt pads make metal-to-metal contact. After metal-to-metal contact is achieved, tighten nuts by another one quarter or one half turn to make sure the bolts and nuts are snug and secure. No torque wrench is required. Excessive torque may lead to bolt or joint failure.

Torque required! Bolts and nuts must always be tightened to the required torque by using a torque wrench. Normally there will be some gaps seen between the bolt pads after the bolts and nuts are fully tightened. Bolt pad gaps should
be equal on both sides of the coupling.

torque wrench

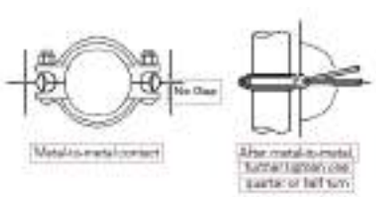
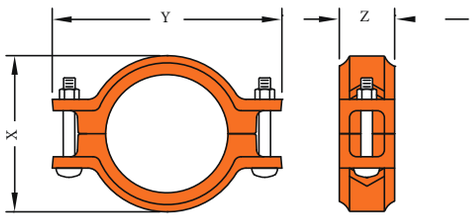


Figure-1GS



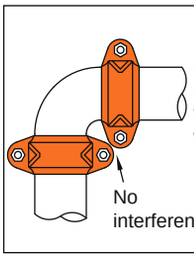
Wingrou Model 1GS is a T&G (tongue & groove) design rigid coupling for moderate pressure applications where rigidity is required including valve connections, mechanical rooms, fire mains and long straight runs. The built-in teeth and T&G mechanism firmly grasp the pipe ends to eliminate undesired flex

Support and hanging requirements correspond to ANSI B31.1, B31.9 and NFPA 13.

Fitting Coating:

RAL 3000 Red paint in Europe,Middle East, Africa, and India.
Orange enamel in USA
Optional: Hot dipped galvanized.

Part No.	Size		Max. Work Pressure	Max. End Load	Allow. Pipe End Sep.	Dimension			Bolt/Nut Size	Approx. Wgt. Each
	Nominal Dia	Actual O.D.				X	Y	Z		
	DN Inches	mm Inches	KPa PSI	N Lbs.	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.
WG1GS100	25 1	33.4 1.315	5170 750	4530 1020	2.3 0.091	54 2.126	98 3.858	44 1.732	M10X50 $^{3}/_{8}$X2	0.55 1.21
WG1GS125	32 $1^{1}/_{4}$	42.4 1.660	5170 750	7300 1620	2.3 0.091	63 2.480	109 4.291	44 1.732	M10X50 $^{3}/_{8}$X2	0.58 1.28
WG1GS150	40 $1^{1}/_{2}$	48.3 1.900	5170 750	9470 2130	2.3 0.091	69 2.717	115 4.528	44 1.732	M10X50 $^{3}/_{8}$X2	0.60 1.32
WG1GS200	50 2	60.3 2.375	4140 600	11820 2660	2.3 0.091	83 3.268	128 5.039	45 1.772	M10X50 $^{3}/_{8}$X2	0.71 1.56
WG1GS250	65 $2^{1}/_{2}$	73.0 2.875	3780 550	15820 3570	2.3 0.091	97 3.819	142 5.591	46 1.811	M10X55 $^{3}/_{8}$X$2^{1}/_{4}$	0.98 2.16
WG1GS290	65 $2^{1}/_{2}$	76.1 3.000	3780 550	17190 3890	2.3 0.091	100 3.937	145 5.709	46 1.811	M10X55 $^{3}/_{8}$X$2^{1}/_{4}$	0.97 2.13
WG1GS300	80 3	88.9 3.500	3780 550	23460 5290	2.7 0.106	113 4.449	159 6.260	47 1.850	M10X55 $^{3}/_{8}$X$2^{1}/_{4}$	1.10 2.42
WG1GS410	100 4	108.0 4.250	3450 500	31610 7090	2.7 0.106	136 5.354	192 7.559	49 1.929	M12X70 $^{1}/_{2}$X$2^{3}/_{4}$	1.44 3.17
WG1GS400	100 4	114.3 4.500	3450 500	35400 7950	2.7 0.106	142 5.591	198 7.795	49 1.929	M12X70 $^{1}/_{2}$X$2^{3}/_{4}$	1.54 3.39
WG1GS510	125 5	133.0 5.250	3450 500	47930 10820	2.7 0.106	163 6.417	224 8.819	50 1.969	M16X85 $^{5}/_{8}$X$3^{3}/_{8}$	1.95 4.30
WG1GS511	125 5	139.7 5.500	3450 500	52880 11880	2.7 0.106	169 6.654	230 9.055	50 1.969	M16X85 $^{5}/_{8}$X$3^{3}/_{8}$	2.00 4.41
WG1GS500	125 5	141.3 5.563	3450 500	54100 12150	2.7 0.106	171 6.732	232 9.134	50 1.969	M16X85 $^{5}/_{8}$X$3^{3}/_{8}$	2.02 4.45
WG1GS601	150 6	159.0 6.250	3450 500	68500 15340	2.7 0.106	190 7.480	249 9.803	51 2.008	M16X85 $^{5}/_{8}$X$3^{3}/_{8}$	2.20 4.85
WG1GS650	150 6	165.1 6.500	3450 500	73860 16590	2.7 0.106	196 7.717	254 10.000	51 2.008	M16X85 $^{5}/_{8}$X$3^{3}/_{8}$	2.26 4.98
WG1GS600	150 6	168.3 6.625	3450 500	76750 17240	2.7 0.106	199 7.835	257 10.118	51 2.008	M16X85 $^{5}/_{8}$X$3^{3}/_{8}$	2.34 5.15
WG1GS800	200 8	219.1 8.625	2750 400	103680 23370	4.9 0.193	256 10.079	328 12.913	58 2.283	M20X115 $^{3}/_{4}$X$4^{1}/_{2}$	4.00 8.81
WG1GS910	250 10	273.0 10.750	2500 350	146340 31770	4.9 0.193	311 12.244	397 15.630	59 2.323	M22X135 $^{7}/_{8}$X$5^{1}/_{2}$	5.17 11.39
WG1GS912	300 12	323.9 12.750	2500 350	205990 44690	4.9 0.193	365 14.370	451 17.756	60 2.362	M22X135 $^{7}/_{8}$X$5^{1}/_{2}$	6.86 15.11



No need to worry about bolt pad interference as the Model 1GS works well with both regular and short-radius elbows and tees

No interference

* Working Pressure is based on roll grooved standard wall carbon steel

* Allowable Axial Displacement and Angular Movement (deflection) figures are for roll grooved Standard steel pipe Values for cut grooved pipe will be double that of roll grooved. These values are maximums; for design and installation purposes these figures should be reduced by: 50% for ¾"/DN20 - 3½"/ DN90; 25% for 4"/DN100 and larger to compensate for jobsite conditions.

* Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-1N

The Figure 1N grooved end flexible couplings are designed to allow for angular or rotational differences between the components being joined after assembly. These couplings provide greater system reliability in situations involving excessive vibration, difficult alignment or seismic activity.

The couplings are made using a Grade 65-45-12 ASTM A536 ductile iron split housing, carbon steel bolts and hex nuts and are sealed at the pipe surface with an EPDM elastomer gasket.

Support and hanging requirements correspond to ANSI B31.1, B31.9 and NFPA 13.

Fitting Coating:
RAL 3000 Red paint in Europe,Middle East, Africa, and India.
Orange enamel in USA
Optional: Hot dipped galvanized.

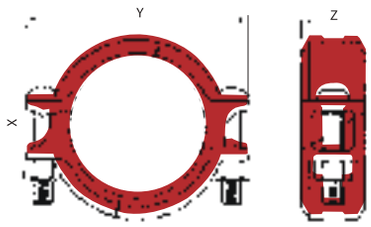
Part No.	Size		Max. Work Pressure	Max. End Load	Allow. Pipe End Sep.	Dimensions			Bolt/Nut Size	Approx. Wgt. Each
	Nominal Dia.	Actual O.D.				X	Y	Z		
	DN Inches	mm Inches	KPa PSI	N Lbs.	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.
WG1N100	25 1	33.4 1.315	5170 750	4530 1020	2.2 0.087	53 2.087	98 3.858	44 1.732	M10X50 $^{3}/_{8}$X2	0.55 1.21
WG1N125	32 $1^{1}/_{4}$	42.4 1.660	5170 750	7300 1620	2.2 0.087	62 2.441	110 4.331	44 1.732	M10X50 $^{3}/_{8}$X2	0.58 1.28
WG1N150	40 $1^{1}/_{2}$	48.3 1.900	5170 750	9470 2130	2.2 0.087	68 2.677	115 4.528	44 1.732	M10X50 $^{3}/_{8}$X2	0.60 1.32
WG1N200	50 2	60.3 2.375	4140 600	11820 2660	2.2 0.087	83 3.268	130 5.118	45 1.772	M10X50 $^{3}/_{8}$X2	0.71 1.56
WG1N250	65 $2^{1}/_{2}$	73.0 2.875	3780 550	15820 3570	2.4 0.094	97 3.819	144 5.669	46 1.811	M10X55 $^{3}/_{8}$X$2^{1}/_{4}$	0.90 1.98
WG1N290	65 $2^{1}/_{2}$	76.1 3.000	3780 550	17190 3890	2.4 0.094	100 3.937	147 5.787	46 1.811	M10X55 $^{3}/_{8}$X$2^{1}/_{4}$	1.00 2.20
WG1N300	80 3	88.9 3.500	3780 550	23460 5290	2.8 0.110	113 4.449	172 6.772	47 1.850	M10X55 $^{3}/_{8}$X$2^{1}/_{4}$	1.11 2.44
WG1N410	100 4	108.0 4.250	3450 500	31610 7090	3.3 0.130	136 5.354	196 7.717	51 2.008	M12X70 $^{1}/_{2}$X$2^{3}/_{4}$	1.62 3.57
WG1N400	100 4	114.3 4.500	3450 500	35400 7950	3.3 0.130	142 5.591	202 7.953	51 2.008	M12X70 $^{1}/_{2}$X$2^{3}/_{4}$	1.66 3.66
WG1N510	125 5	133.0 5.250	3450 500	47930 10820	3.6 0.142	166 6.535	230 9.055	51 2.008	M16X85 $^{5}/_{8}$X$3^{3}/_{8}$	2.37 5.22
WG1N511	125 5	139.7 5.500	3450 500	52880 11880	3.6 0.142	172 6.772	236 9.291	51 2.008	M16X85 $^{5}/_{8}$X$3^{3}/_{8}$	2.42 5.33
WG1N500	125 5	141.3 5.563	3450 500	54100 12150	3.6 0.142	174 6.850	238 9.370	51 2.008	M16X85 $^{5}/_{8}$X$3^{3}/_{8}$	2.44 5.37
WG1N601	150 6	159.0 6.250	3450 500	68500 15340	3.9 0.154	190 7.480	266 10.472	52 2.047	M16X85 $^{5}/_{8}$X$3^{3}/_{8}$	2.72 5.99
WG1N650	150 6	165.1 6.500	3450 500	73860 16590	3.9 0.154	196 7.717	272 10.709	52 2.047	M16X85 $^{5}/_{8}$X$3^{3}/_{8}$	2.78 6.12
WG1N600	150 6	168.3 6.625	3450 500	76750 17240	3.9 0.154	199 7.835	275 10.827	52 2.047	M16X85 $^{5}/_{8}$X$3^{3}/_{8}$	2.83 6.23
WG1N800	200 8	219.1 8.625	2750 400	103680 23370	4.9 0.193	256 10.079	343 13.504	61 2.402	M20X115 $^{3}/_{4}$X$4^{1}/_{2}$	5.06 11.15
WG1N910	250 10	273.0 10.750	2500 350	146340 31770	4.9 0.193	311 12.244	397 15.630	61 2.402	M22X135 $^{7}/_{8}$X$5^{1}/_{2}$	5.91 13.02
WG1N912	300 12	323.9 12.750	2500 350	205990 44690	4.9 0.193	365 14.370	451 17.756	62 2.441	M22X135 $^{7}/_{8}$X$5^{1}/_{2}$	7.39 16.28

Working Pressure is based on roll grooved standard wall carbon steel pipe.

Allowable Axial Displacement and Angular Movement (deflection) figures are for roll grooved standard steel pipe. Values for cut grooved pipe will be double that of roll grooved. These values are maximums; for design and installation purposes these figures should be reduced by: 50% for ¾"/DN20 - 3½"/DN90; 25%for 4"/DN100 and larger to compensate for jobsite conditions.

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-1X



The Wingrou Model 1X is an angle –pad design standard rigid coupling for moderate pressure piping services including Fire mains, long straight run and valve connections.This angle pad rigid coupling allows for more accurate positioning of the tube end, forming a fix ed tube end separation, which should be consid-ered the design and installation.

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- Unique angle-pad design for rigidity
- Allows supportying/ hanging same as welded or threaded in accordance with NEPA-13 requirements
- For use in fire protection services only
- Reduces installation time up to 60%
- Available with hot dipped galvanized finish
- Pressure rated up to 300psi/2065 kPa

Part No.	Size		Max. Work Pressure	Max. End Load	Allow. Pipe End Sep.	Dimensions			Bolt/Nut Size	Approx. Wgt. Each
	Nominal Dia.	Actual O.D.				X	Y	Z		
	DN Inches	mm Inches	KPa PSI	N Lbs.	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.
WG1X100	25 1	33.4 1.315	5170 750	4530 1020	2.2 0.086	55 2.165	98 3.858	45 1.772	M10X50 3/8X2	0.49 1.08
WG1X125	32 1 1/4	42.4 1.660	5170 750	7300 1620	2.2 0.086	64 2.520	110 4.331	45 1.772	M10X50 3/8X2	0.58 1.28
WG1X150	40 1 1/2	48.3 1.900	5170 750	9470 2130	2.2 0.086	70 2.756	115 4.528	45 1.772	M10X50 3/8X2	0.62 1.37
WG1X200	50 2	60.3 2.375	4140 600	11820 2660	2.2 0.086	85 3.346	130 5.118	47 1.850	M10X50 3/8X2	0.77 1.70
WG1X250	65 2 1/2	73.0 2.875	3780 550	15820 3570	2.7 0.106	100 3.937	148 5.827	49 1.929	M10X55 3/8X2 1/4	0.98 2.16
WG1X290	65 2 1/2	76.1 3.000	3780 550	17190 3890	2.7 0.106	103 4.055	151 5.945	49 1.929	M10X55 3/8X2 1/4	1.00 2.20
WG1X300	80 3	88.9 3.500	3780 550	23460 5290	2.7 0.106	116 4.567	164 6.457	49 1.929	M10X55 3/8X2 1/4	1.11 2.44
WG1X410	100 4	108.0 4.250	3450 500	31610 7090	3.3 0.130	138 5.433	188 7.402	51 2.008	M12X70 1/2X2 3/4	1.48 3.26
WG1X400	100 4	114.3 4.500	3450 500	35400 7950	3.3 0.130	144 5.669	194 7.638	51 2.008	M12X70 1/2X2 3/4	1.52 3.35
WG1X510	125 5	133.0 5.250	3450 500	47930 10820	3.3 0.130	165 6.496	226 8.898	51 2.008	M12X75 1/2X3	2.07 4.56
WG1X511	125 5	139.7 5.500	3450 500	52880 11880	3.3 0.130	172 6.772	232 9.134	51 2.008	M12X75 1/2X3	2.12 4.67
WG1X500	125 5	141.3 5.563	3450 500	54100 12150	3.3 0.130	173 6.811	234 9.213	51 2.008	M12X75 1/2X3	2.14 4.71
WG1X601	150 6	159.0 6.250	3450 500	68500 15340	3.3 0.130	192 7.559	252 9.921	52 2.047	M12X75 1/2X3	2.42 5.33
WG1X650	150 6	165.1 6.500	3450 500	73860 16590	3.3 0.130	198 7.795	258 10.157	52 2.047	M12X75 1/2X3	2.48 5.46
WG1X600	150 6	168.3 6.625	3450 500	76750 17240	3.3 0.130	201 7.913	261 10.276	52 2.047	M12X75 1/2X3	2.53 5.57
WG1X800	200 8	219.1 8.625	2750 400	103680 23370	4.9 0.193	260 10.236	325 12.795	61 2.402	M16X85 5/8X3 3/8	4.49 9.89
WG1X910	250 10	273.0 10.750	2500 350	146340 31770	4.9 0.193	314 12.362	397 15.630	61 2.402	M20X115 3/4X4 1/2	5.53 12.18
WG1X912	300 12	323.9 12.750	2500 350	205990 44690	4.9 0.193	368 14.488	451 17.756	62 2.441	M20X115 3/4X4 1/2	7.22 15.90

- Working Pressure is based on roll grooved standard wall carbon steel pipe.
- Allowable Axial Displacement and Angular Movement (deflection) figures are for roll grooved standard steel pipe. Values for cut grooved pipe will be double that of roll grooved. These values are maximums; for design and installation purposes these figures should be reduced by: 50% for ¾"/DN20 - 3½"/DN90; 25% for 4"/DN100 and larger to compensate for jobsite conditions.
- Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-1NH

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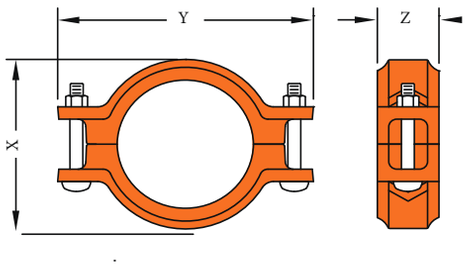


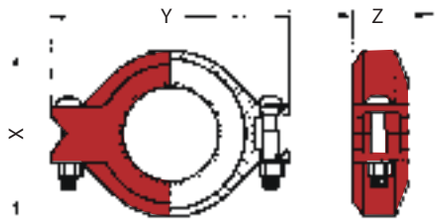
The Wingrou Figure1NH is an extra heavy flexible coupling designed for high pressure services up to 1000 psi (70 Bar). This flexible coupling is painted RAL 3000 red paint and is supplied with a standard C-shaped gasket and heavy duty bolts and nuts. The Model 1NH can be installed on standard roll or cut grooved pipes or components. Sizes 2" through 4" require a bolt torque of 60 - 70 Lbs-Ft. with some bolt gaps. For sizes 6" and above, the bolt pads will make metal to metal contact when properly installed with no torque wrench required.

Part No.	Size		Max. Work	Max. End	Allow. Pipe	Dimensions			Bolt/Nut	Approx.
	Nominal Dia.	Actual O.D.	Pressure	Load	End Sep.	X	Y	Z	Size	Wgt. Each
	DN Inches	mm Inches	KPa PSI	N Lbs.	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.
WG1NH100	25 1	33.4 1.315	10350 1500	9068 2037	2.2 0.087	57 2.244	101 3.976	44 1.732	M10X55 $^3/_8$X2$^1/_4$	0.73 1.61
WG1NH125	32 1$^1/_4$	42.4 1.660	860 1250	1214 2705	2.2 0.087	66 2.598	113 4.449	45 1.772	M12X60 $^1/_2$X2$^3/_8$	0.91 2.00
WG1NH150	40 1$^1/_2$	48.3 1.900	860 1250	1576 3544	2.2 0.087	72 2.835	121 4.764	45 1.772	M12X60 $^1/_2$X2$^3/_8$	0.97 2.14
WG1NH200	50 2	60.3 2.375	860 1250	2456 5538	2.2 0.087	87 3.425	138 5.433	47 1.850	M12X60 $^1/_2$X2$^3/_8$	1.20 2.64
WG1NH250	65 2$^1/_2$	73.0 2.875	6900 1000	28879 6492	2.4 0.094	101 3.976	152 5.984	49 1.929	M12X75 $^1/_2$X3	1.52 3.35
WG1NH290	65 2$^1/_2$	76.1 3.000	6900 1000	31384 7069	2.4 0.094	104 4.094	155 6.102	49 1.929	M12X75 $^1/_2$X3	1.54 3.39
WG1NH300	80 3	88.9 3.500	6900 1000	42830 9621	2.8 0.110	118 4.646	170 6.693	49 1.929	M12X75 $^1/_2$X3	1.71 3.77
WG1NH410	100 4	108.0 4.250	6900 1000	63210 14186	3.3 0.130	142 5.591	206 8.110	51 2.008	M16X85 $^5/_8$X3$^3/_8$	2.60 5.73
WG1NH400	100 4	114.3 4.500	6900 1000	70800 15904	3.3 0.130	148 5.827	212 8.346	51 2.008	M16X85 $^5/_8$X3$^3/_8$	2.67 5.88
WG1NH510	125 5	133.0 5.250	6900 1000	95861 21648	3.6 0.142	169 6.654	243 9.567	51 2.008	M20X115 $^3/_4$X4$^1/_2$	3.58 7.89
WG1NH511	125 5	139.7 5.500	6900 1000	105763 23758	3.6 0.142	176 6.929	249 9.803	51 2.008	M20X115 $^3/_4$X4$^1/_2$	3.65 8.04
WG1NH500	125 5	141.3 5.563	6900 1000	108199 24306	3.6 0.142	177 6.969	251 9.882	51 2.008	M20X115 $^3/_4$X4$^1/_2$	3.67 8.08
WG1NH601	150 6	159.0 6.250	6900 1000	137004 30680	3.9 0.154	197 7.756	271 10.669	51 2.008	M20X115 $^3/_4$X4$^1/_2$	4.05 8.92
WG1NH650	150 6	165.1 6.500	6900 1000	147718 33183	3.9 0.154	203 7.992	277 10.906	51 2.008	M20X115 $^3/_4$X4$^1/_2$	4.13 9.10
WG1NH600	150 6	168.3 6.625	6900 1000	153500 34472	3.9 0.154	206 8.110	279 10.984	51 2.008	M20X115 $^3/_4$X4$^1/_2$	4.15 9.14
WG1NH800	200 8	219.1 8.625	5500 800	207366 46741	4.9 0.193	267 10.512	357 14.055	63 2.480	M22X135 $^7/_8$X5$^1/_2$	8.35 18.39
WG1NH910	250 10	273.0 10.750	5500 800	321943 72610	4.9 0.193	320 12.598	410 16.142	65 2.559	M24X135 1X5$^1/_2$	10.70 23.57
WG1NH912	300 12	323.9 12.750	5500 800	453185 102141	4.9 0.193	370 14.567	460 18.110	65 2.559	M24X135 1X5$^1/_2$	12.30 27.09

* Working Pressure is based on roll grooved standard wall carbon steel pipe.
* Allowable Axial Displacement and Angular Movement (deflection) figures are for roll grooved standard steel pipe. Values for cut grooved pipe will be double that of roll grooved. These values are maximums; for design and installation purposes these figures should be reduced by: 50% for ¾"/DN20 - 3½"/DN90; 25% for 4"/DN100 and larger to compensate for jobsite conditions.
* Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-1NR

FM APPROVED c UL us LISTED



- The specially designed rubber gasket helps prevent small pipe from telescoping into larger pipe during vertical assembly.
- Direct reduction on the piping run
- Designed to replace two coupling and a reducing fittings
- Special reducing gasket for pressure responive sealing
- Pressure rated up to 300psi/2065kPa /21 bars

Fitting Coating:

Red enamel in Europe, Middle East, Africa, and India. Orange enamel in USA
Optional: Hot dipped galvanized.

	Size	Max. Work	Max. End	Allow. Pipe	Dimensions			Bolt/Nut	Approx.
	Run Pipe X Bran Pipe	Pressure	Load	End Sep.	X	Y	Z	Size	Wgt. Each
	mm Inches X mm Inches	KPa PSI	N Lbs.	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.
WG1NR150X125	48.3 1 1/2 X 42.4 1 1/4	3800 550	5365 1190	2.4 0.094	64 2.520	129 5.079	47 1.850	M10X50 3/8X2	0.66 1.45
WG1NR200X125	60.3 2 X 42.4 1 1/4	3800 550	5365 1190	2.6 0.102	80 3.150	145 5.709	47 1.850	M10X50 3/8X2	0.86 1.89
WG1NR200X150	60.3 2 X 48.3 1 1/2	3800 550	6963 1559	2.6 0.102	80 3.150	145 5.709	47 1.850	M10X50 3/8X2	0.87 1.92
WG1NR250X200	73.0 2 1/2 X 60.3 2	3800 550	10852 2437	2.9 0.114	95 3.740	160 6.299	49 1.929	M12X75 1/2X3	1.31 2.89
WG1NR290X200	76.1 2 1/2 X 60.3 2	3800 550	10852 2437	2.9 0.114	98 3.858	164 6.457	49 1.929	M12X75 1/2X3	1.35 2.97
WG1NR300X200	88.9 3 X 60.3 2	3450 500	9852 2215	3.1 0.122	115 4.528	178 7.008	49 1.929	M12X75 1/2X3	1.59 3.50
WG1NR300X250	88.9 3 X 73.0 2 1/2	3800 550	15905 3571	3.1 0.122	115 4.528	178 7.008	49 1.929	M12X75 1/2X3	1.54 3.39
WG1NR300X290	88.9 3 X 76.1 2 1/2	3800 550	17284 3888	3.1 0.122	115 4.528	178 7.008	49 1.929	M12X75 1/2X3	1.48 3.26
WG1NR400X200	114.3 4 X 60.3 2	3450 500	9852 2215	3.5 0.138	141 5.551	208 8.189	51 2.008	M16X85 5/8X3 3/8	2.72 5.99
WG1NR400X250	114.3 4 X 73.0 2 1/2	3450 500	14440 3246	3.5 0.138	141 5.551	208 8.189	51 2.008	M16X85 5/8X3 3/8	2.55 5.62
WG1NR400X290	114.3 4 X 76.1 2 1/2	3450 500	15692 3534	3.5 0.138	141 5.551	208 8.189	51 2.008	M16X85 5/8X3 3/8	2.51 5.53
WG1NR400X300	114.3 4 X 88.9 3	3800 550	23587 5292	3.5 0.138	141 5.551	208 8.189	51 2.008	M16X85 5/8X3 3/8	2.33 5.13
WG1NR511X300	139.7 5 X 88.9 3	2750 400	17070 3848	4.0 0.157	168 6.614	247 9.724	51 2.008	M20X115 3/4X4 1/2	3.68 8.11
WG1NR511X400	139.7 5 X 114.3 4	3100 450	31809 7157	4.0 0.157	168 6.614	247 9.724	51 2.008	M20X115 3/4X4 1/2	3.19 7.03
WG1NR500X300	141.3 5 X 88.9 3	2750 400	17070 3848	4.0 0.157	169 6.654	249 9.803	51 2.008	M20X115 3/4X4 1/2	3.74 8.24
WG1NR500X400	141.3 5 X 114.3 4	3100 450	31809 7157	4.0 0.157	169 6.654	249 9.803	51 2.008	M20X115 3/4X4 1/2	3.45 7.60
WG1NR650X400	165.1 6 X 114.3 4	2750 400	28217 6362	4.7 0.185	197 7.756	276 10.866	51 2.008	M20X115 3/4X4 1/2	4.25 9.36
WG1NR650X500	165.1 6 X 139.7 5	3100 450	47517 10691	4.7 0.185	197 7.756	276 10.866	51 2.008	M20X115 3/4X4 1/2	3.68 8.11
WG1NR600X400	168.3 6 X 114.3 4	2750 400	28217 6362	4.7 0.185	199 7.835	276 10.866	51 2.008	M20X115 3/4X4 1/2	4.24 9.34
WG1NR600X500	168.3 6 X 141.3 5	3100 450	48611 10938	4.7 0.185	199 7.835	276 10.866	51 2.008	M20X115 3/4X4 1/2	3.82 8.41
WG1NR800X650	219.1 8 X 165.1 6	2750 400	58873 13273	4.9 0.193	261 10.276	356 14.016	61 2.402	M22X135 7/8X5 1/2	8.45 18.61
WG1NR800X600	219.1 8 X 168.3 6	2750 400	61178 13789	4.9 0.193	261 10.276	356 14.016	61 2.402	M22X135 7/8X5 1/2	8.38 18.46

* Working Pressure is based on roll grooved standard wall carbon steel pipe.

* Allowable Axial Displacement and Angular Movement (deflection) figures are for roll grooved standard steel pipe. Values for cut grooved pipe will be double that of roll grooved. These values are maximums; for design and installation purposes these figures should be reduced by: 50% for ¾"/DN20 - 3½"/DN90; 25% for 4"/DN100 and larger to compensate for jobsite conditions.

* Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

CAUTION Model 1N / INR coupling should not be used with an end cap, as the end maybe sucked into the pipe when draining the system.

INSTALLATION INSTRUCTIONS:

01. Cut or drill in pipe Hole diameter for each mechanical branch out-let listed on the chart pertaining to the product Hole must be drilled on the center-line of the pipe. Remove the cut piece and cutting chips. make sure that the pipe surface within 7/8 " of the hole is clean, smooth and free of indentations or projections which would afect proper sealing

02. Remove one nut and bolt from housing loosen the other nut until it flush with the end of the bolt. Remove the tape and lift gasket.

03. Check suitability of gasket for intended service . Reposition the gaskinto the housing using alignment tabs on the sides for proper positioning.

04. Rotate the lower housing approximately 90 Degree away from upper or outlet section. Place the upper onto the surface of the pipe in line with the outlet hole prepared per instructions and rotate the lower section around the pipe and close the two halve.

05. insert bolt in its hole and finger tighten both nuts, making sure that locating collar is in the outlet hole. Also make sure that the positioning lugs aligned properly.

06. Tighten nuts uniformly until the gasket pocket area of the upper housing is in the complete contact with pipe surface and the assembly is rigid.Nuts must be tightened with even gaps between bolt pads. Torgue in excess of what is recommended is not desirable.

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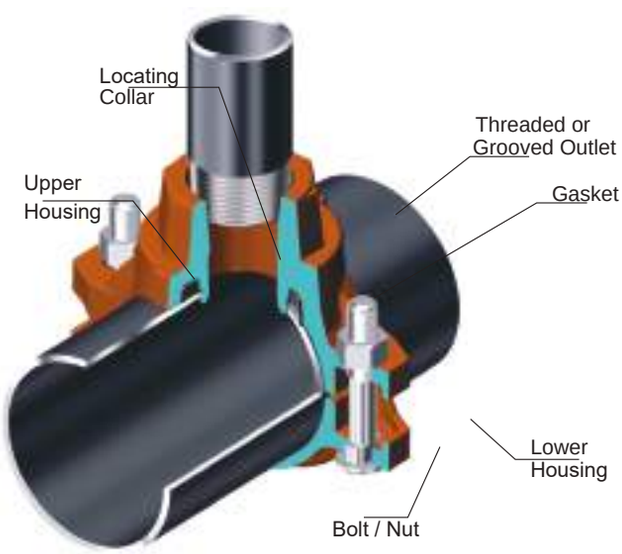
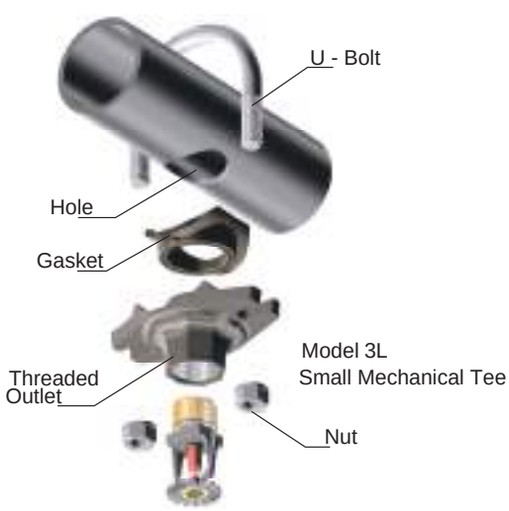
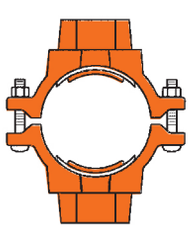
WARNING: Depressurize and drain the piping system before attempting to install, remove, or adjust any piping products. Wear safety glasses, hardhat, and foot protection.



The Model 3L Saddle-Let mechanical tee is the ideal outlet fitting for direct connection to sprinkler heads, short risers, drops, and or gauges.



● Grooved-end and threaded outlets are available

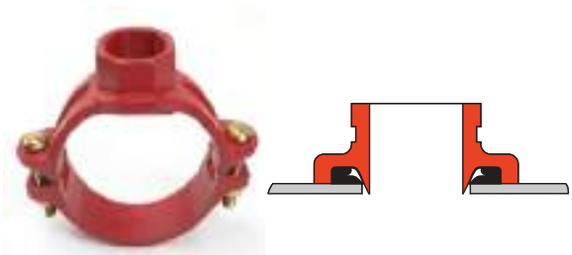


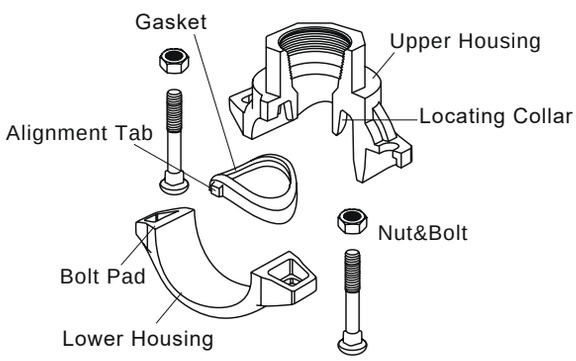
A mechanical cross connection can be made by combining two upper housing segments -(Style 3GS/3JS)

Mechanical Tees

Wingrou mechanic a l tees provide a fast and easy mid-point branch outlet, eliminating the need for welding or the use of multiple fittings.

The Model 3J features a female threaded outlet and 3G features a grooved end outlet. Model 3J (female threaded outlet) and 3G (grooved end outlet) are available in 8” sizes. The Model 3L Saddle-let features a compact-design for making direct connections to sprinkler heads, drop nipples and or gauges.



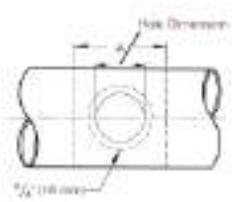


When bolts are tightened with a proper torque, the outlet housing makes metal to metal contact with the outer surface of the pipe.

It is normal to see bolt pad gaps, though they should be equal on both sides of the mechanical tee.

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 in each data chart 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 ⅝” (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 of dirt, scale or any imperfection that could affect proper seating or assembly of the fitting.

Hole Size: The hole sizes are dictated by the branch size of the mechanical tee. Refer to product data chart.

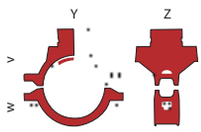
Model No. Wingrou
TWK111A Hole Cutting Tool

The hole must be cleanly cut using the correct size hole-saw and shall have a smooth edge. Never use a torch for cutting a hole.

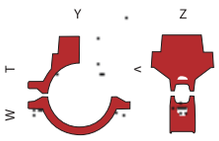
Figure-3G/3J

Model 3G Grooved Outlet Mechanical Tee

Model 3JThreaded Mechanical Tee



Model 3G Grooved Outlet Mechanical Tee



Model 3JThreaded Mechanical Tee

The Model 3G & 3J Mechanical Tee provides a fast and easy mid-pipe threaded or groove branch outlet. It eliminates the need for welding or mulple fittings. The mechanical tee utilizes ductile iron housings, a grade E moulded gasket and heat-treated carbon steel track bolts and nuts. Pressure rated to 300 psi (20 bar). Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Part No.	Size			Max. Work Pressure	Hole Size	Dimensions						Bolt/Nut Size	Approx. Wgt.	
	Run Pipe	X	Branch Pipe			W	Y	Z	3G V	3J V	3J T		3G	3J
	mm Inches	X	mm Inches	KPa PSI	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.	kg Lbs.
WG3G/3J200100	60.3 2	X	33.4 1	3450 500	38 1.50	37 1.46	134 5.28	70 2.76	64 2.52	62 2.44	46 1.81	M12X65 $^1/_2$X2$^1/_2$	0.85 1.87	0.81 1.78
WG3G/3J200125			42.4 $1^1/_4$	3450 500	44.5 1.75	37 1.46	134 5.28	77 3.03	65 2.56	65 2.56	46 1.81	M12X65 $^1/_2$X2$^1/_2$	0.89 1.96	0.92 2..03
WG3G/3J200150			48.3 $1^1/_2$	3450 500	44.5 1.75	37 1.46	134 5.28	77 3.03	65 2.56	65 2.56	46 1.81	M12X65 $^1/_2$X2$^1/_2$	0.91 2.00	0.98 2.16
WG3G/3J250100	73.0 $2^1/_2$	X	33.4 1	3450 500	38 1.50	43 1.69	148 5.83	68 2.68	74 2.91	64 2.52	46 1.81	M12X75 $^1/_2$X3	1.25 2.75	1.16 2.56
WG3G/3J250125			42.4 $1^1/_4$	3450 500	44.5 1.75	43 1.69	148 5.83	76 2.99	74 2.91	67 2.64	46 1.81	M12X75 $^1/_2$X3	1.28 2.82	1.33 2.93
WG3G/3J250150			48.3 $1^1/_2$	3450 500	51 2.00	43 1.69	148 5.83	83 3.27	74 2.91	67 2.64	46 1.81	M12X75 $^1/_2$X3	1.39 3.06	1.52 3.35
WG3G/3J290100	76.1 21/2	X	33.4 1	3450 500	38 1.50	45 1.77	151 5.94	68 2.68	76 2.99	66 2.60	47 1.85	M12X75 $^1/_2$X3	1.19 2.62	1.17 2.58
WG3G/3J290125			42.4 $1^1/_4$	3450 500	44.5 1.75	45 1.77	151 5.94	76 2.99	76 2.99	68 2.68	47 1.85	M12X75 $^1/_2$X3	1.22 2.69	1.27 2.80
WG3G/3J290150			48.3 $1^1/_2$	3450 500	51 2.00	45 1.77	151 5.94	83 3.27	76 2.99	69 2.72	47 1.85	M12X75 $^1/_2$X3	1.27 2.80	1.33 2.93
WG3G/3J300100	88.9 3	X	33.4 1	3450 500	38 1.50	52 2.05	161 6.34	68 2.68	82 3.23	72 2.83	54 2.13	M12X75 $^1/_2$X3	1.28 2.82	1.25 2.75
WG3G/3J300125			42.4 $1^1/_4$	3450 500	44.5 1.75	52 2.05	161 6.34	75 2.95	82 3.23	74 2.91	54 2.13	M12X75 $^1/_2$X3	1.31 2.89	1.36 3.00
WG3G/3J300150			48.3 $1^1/_2$	3450 500	51 2.00	52 2.05	161 6.34	82 3.23	82 3.23	75 2.95	54 2.13	M12X75 $^1/_2$X3	1.37 3.02	1.43 3.15
WG3G/3J300200			60.3 2	3450 500	64 2.50	52 2.05	161 6.34	95 3.74	82 3.23	79 3.11	54 2.13	M12X75 $^1/_2$X3	1.44 3.17	1.56 3.44
WG3G/3J410100	108.0 4	X	33.4 1	3450 500	38 1.50	62 2.44	182 7.17	69 2.72	93 3.66	84 3.31	65 2.56	M12X75 $^1/_2$X3	1.48 3.26	1.44 3.17
WG3G/3J410125			42.4 $1^1/_4$	3450 500	44.5 1.75	62 2.44	182 7.17	75 2.95	93 3.66	86 3.39	65 2.56	M12X75 $^1/_2$X3	1.52 3.35	1.56 3.44
WG3G/3J410150			48.3 $1^1/_2$	3450 500	51 2.00	62 2.44	182 7.17	83 3.27	93 3.66	86 3.39	65 2.56	M12X75 $^1/_2$X3	1.59 3.50	1.64 3.61
WG3G/3J410200			60.3 2	3450 500	64 2.50	62 2.44	182 7.17	95 3.74	93 3.66	90 3.54	65 2.56	M12X75 $^1/_2$X3	1.7 3.74	1.81 3.99
WG3G/3J410250			76.1 $2^1/_2$	3450 500	70 2.75	62 2.44	182 7.17	101 3.98	94 3.70	94 3.70	65 2.56	M12X75 $^1/_2$X3	1.91 4.21	2.13 4.69
WG3G/3J400100	114.3 4	X	33.4 1	3450 500	38 1.50	65 2.56	188 7.40	69 2.72	96 3.78	87 3.43	68 2.68	M12X75 $^1/_2$X3	1.52 3.35	1.45 3.19
WG3G/3J400125			42.4 $1^1/_4$	3450 500	44.5 1.75	65 2.56	188 7.40	75 2.95	96 3.78	89 3.50	68 2.68	M12X75 $^1/_2$X3	1.55 3.41	1.58 3.48
WG3G/3J400150			48.3 $1^1/_2$	3450 500	51 2.00	65 2.56	188 7.40	83 3.27	96 3.78	89 3.50	68 2.68	M12X75 $^1/_2$X3	1.62 3.57	1.67 3.68
WG3G/3J400200			60.3 2	3450 500	64 2.50	65 2.56	188 7.40	95 3.74	96 3.78	93 3.66	68 2.68	M12X75 $^1/_2$X3	1.75 3.85	1.86 4.10
WG3G/3J400250			73.0 $2^1/_2$	3450 500	70 2.75	65 2.56	188 7.40	101 3.98	97 3.82	97 3.82	68 2.68	M12X75 $^1/_2$X3	1.91 4.21	2.02 4.45
WG3G/3J400290			76.1 $2^1/_2$	3450 500	70 2.75	65 2.56	188 7.40	101 3.98	97 3.82	97 3.82	68 2.68	M12X75 $^1/_2$X3	1.93 4.25	2.05 4.52
WG3G/3J400300			88.9 3	3450 500	89 3.50	65 2.56	188 7.40	122 4.80	97 3.82	100 3.94	68 2.68	M12X75 $^1/_2$X3	2.07 4.56	2.31 5.09

Important : Make special note of the hole saw size and maximum diameter allowed on these sizes deviation could lead to joint failure.

Figure-3G/3J

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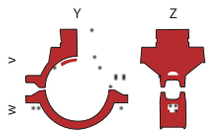
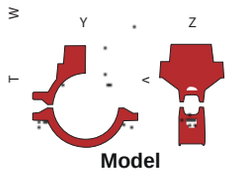
Model 3G Grooved Outlet Mechanical Tee

Model 3JThreaded Mechanical Tee



Model 3G Grooved Outlet Mechanical Tee



Model 3JThreaded Mechanical Tee

The Model 3G & 3J Mechanical Tees provide a fast and easy mid-pipe threaded or Groove branch outlet. The 3G & 3J eliminate the need for welding or multiple fittings. The mechanical tee utilizes ductile iron housings, a grade E moulded gasket and heat-treated carbon steel track bolts and nuts. UL/FM working pressure of Model 3G & 3J rated to 300 psi (20 Bar).

Part No.	Size	Max. Work Pressure	Hole Size	Dimensions						Bolt/Nut Size	Approx. Wgt.	
	Run Pipe X Branch Pipe			W	Y	Z	3G V	3J V	3J T		3G	3J
	mm X mm Inches X Inches	KPa PSI	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.	kg Lbs.
WG3G/3J200100	133.0 X 33.4 5 1	3450 500	38 1.50	75 2.95	239 9.41	68 2.68	107 4.21	97 3.82	79 3.11	M16X85 $^5/_8$X3$^3/_8$	2.1 4.63	2.03 4.47
WG3G/3J200125	42.4 $1^1/_4$	3450 500	44.5 1.75	75 2.95	239 9.41	75 2.95	107 4.21	100 3.94	79 3.11	M16X85 $^5/_8$X3$^3/_8$	2.13 4.69	2.17 4.78
WG3G/3J200150	48.3 $1^1/_2$	3450 500	51 2.00	75 2.95	239 9.41	81 3.19	107 4.21	100 3.94	79 3.11	M16X85 $^5/_8$X3$^3/_8$	2.21 4.87	2.26 4.98
WG3G/3J250100	60.3 2	3450 500	64 2.50	75 2.95	239 9.41	95 3.74	107 4.21	104 4.09	79 3.11	M16X85 $^5/_8$X3$^3/_8$	2.36 5.20	2.47 5.44
WG3G/3J250125	76.1 $2^1/_2$	3450 500	70 2.75	75 2.95	239 9.41	103 4.06	107 4.21	107 4.21	79 3.11	M16X85 $^5/_8$X3$^3/_8$	2.58 5.68	2.79 6.15
WG3G/3J250150	88.9 3	3450 500	89 3.50	75 2.95	239 9.41	120 4.72	107 4.21	111 4.37	79 3.11	M16X85 $^5/_8$X3$^3/_8$	2.71 5.97	3.04 6.70
WG3G/3J290100	139.7 X 33.4 5 1	3450 500	38 1.50	78 3.07	232 9.13	68 2.68	110 4.33	100 3.94	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.15 4.74	2.08 4.58
WG3G/3J290125	42.4 $1^1/_4$	3450 500	44.5 1.75	78 3.07	232 9.13	75 2.95	110 4.33	103 4.06	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.19 4.82	2.23 4.91
WG3G/3J290150	48.3 $1^1/_2$	3450 500	51 2.00	78 3.07	232 9.13	81 3.19	110 4.33	103 4.06	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.26 4.98	2.31 5.09
WG3G/3J300100	60.3 2	3450 500	64 2.50	78 3.07	232 9.13	95 3.74	110 4.33	107 4.21	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.42 5.33	2.53 5.57
WG3G/3J300125	76.1 $2^1/_2$	3450 500	70 2.75	78 3.07	232 9.13	103 4.06	110 4.33	110 4.33	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.65 5.84	2.86 6.30
WG3G/3J300150	88.9 3	3450 500	89 3.50	78 3.07	232 9.13	120 4.72	110 4.33	114 4.49	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.77 6.10	3.1 6.83
WG3G/3J300200	141.3 X 33.4 5 1	3450 500	38 1.50	79 3.11	234 9.21	68 2.68	111 4.37	99 3.90	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.14 4.71	2.07 4.56
WG3G/3J410100	42.4 $1^1/_4$	3450 500	44.5 1.75	79 3.11	234 9.21	75 2.95	111 4.37	102 4.02	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.18 4.80	2.22 4.89
WG3G/3J410125	48.3 $1^1/_2$	3450 500	51 2.00	79 3.11	234 9.21	81 3.19	111 4.37	102 4.02	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.26 4.98	2.31 5.09
WG3G/3J410150	60.3 2	3450 500	64 2.50	79 3.11	234 9.21	95 3.74	111 4.37	106 4.17	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.42 5.33	2.52 5.55
WG3G/3J410200	73.0 $2^1/_2$	3450 500	70 2.75	79 3.11	234 9.21	103 4.06	112 4.41	109 4.29	83 3.27	M16X85 $^5/_8$X3$^3/_8$	2.63 5.79	2.83 6.23
WG3G/3J410250	88.9 3	3450 500	89 3.50	79 3.11	234 9.21	120 4.72	112 4.41	113 4.45	83 3.27	M16X85 $^5/_8$X3$^3/_8$	2.77 6.10	3.1 6.83
WG3G/3J400100	159.0 X 33.4 6 1	3450 500	38 1.50	89 3.50	251 9.88	68 2.68	121 4.76	111 4.37	92 3.62	M16X85 $^5/_8$X3$^3/_8$	2.4 5.29	2.3 5.07
WG3G/3J400X125	42.4 $1^1/_4$	3450 500	44.5 1.75	89 3.50	251 9.88	74 2.91	121 4.76	113 4.45	92 3.62	M16X85 $^5/_8$X3$^3/_8$	2.44 5.37	2.47 5.44
WG3G/3J400X150	48.3 $1^1/_2$	3450 500	51 2.00	89 3.50	251 9.88	80 3.15	121 4.76	114 4.49	92 3.62	M16X85 $^5/_8$X3$^3/_8$	2.51 5.53	2.56 5.64
WG3G/3J400X200	60.3 2	3450 500	64 2.50	89 3.50	251 9.88	94 3.70	121 4.76	117 4.61	92 3.62	M16X85 $^5/_8$X3$^3/_8$	2.72 5.99	2.82 6.21
WG3G/3J400X250	76.1 $2^1/_2$	3450 500	70 2.75	89 3.50	251 9.88	103 4.06	121 4.76	121 4.76	92 3.62	M16X85 $^5/_8$X3$^3/_8$	3.09 6.81	3.29 7.25
WG3G/3J400X290	88.9 3	3450 500	89 3.50	89 3.50	251 9.88	120 4.72	121 4.76	124 4.88	92 3.62	M16X85 $^5/_8$X3$^3/_8$	3.09 6.81	3.42 7.53
WG3G/3J400X300	108.0 4	3450 500	114 4.50	89 3.50	251 9.88	146 5.75	123 4.84	-- --	92 3.62	M16X85 $^5/_8$X3$^3/_8$	3.44 7.58	-- --
	114.3 4	3450 500	114 4.50	89 3.50	251 9.88	146 5.75	123 4.84	-- --	92 3.62	M16X85 $^5/_8$X3$^3/_8$	3.49 7.69	-- --

Important: Make special note of the hole saw size and maximum diameter allowed on these sizes, deviation could lead to joint failure

Figure-3G/3J

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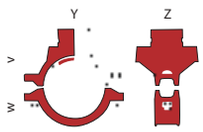
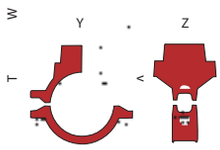
Model 3G Grooved Outlet Mechanical Tee

Model 3JThreaded Mechanical Tee



Model 3G Grooved Outlet Mechanical Tee



Model 3JThreaded Mechanical Tee

The Figure 3G & 3J Mechanical Tee provides a fast and easy mid-pipe threaded branch outlet. The mechanical tee utilizes ductile iron housings, a grade E gasket and heat-treated carbon steel track bolts and nuts.

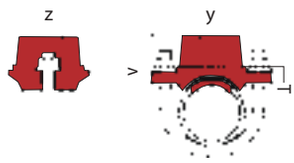
Fitting Coating:

Red enamel in Europe, Middle East, Africa, and India.
Orange enamel in USA
Optional: Hot dipped galvanized

Size			Max. Work Pressure	Hole Size	Dimensions						Bolt/Nut Size	Approx. Wgt.	
Run Pipe	X	Branch Pipe			W	Y	Z	3G V	3J V	3J T		3G	3J
mm Inches	X	mm Inches	KPa PSI	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.	kg Lbs.
165.1 6	X	33.4 1	3450 500	38 1.50	95 3.74	124 4.88	114 4.49	92 3.62	257 10.12	68 2.68	M16X85 $^5/_8$X$3^3/_8$	2.42 5.33	2.31 5.09
		42.4 $1^1/_4$	3450 500	44.5 1.75	95 3.74	124 4.88	116 4.57	92 3.62	257 10.12	74 2.91	M16X85 $^5/_8$X$3^3/_8$	2.46 5.42	2.5 5.51
		48.3 $1^1/_2$	3450 500	51 2.00	95 3.74	124 4.88	117 4.61	92 3.62	257 10.12	80 3.15	M16X85 $^5/_8$X$3^3/_8$	2.53 5.57	2.58 5.68
		60.3 2	3450 500	64 2.50	95 3.74	124 4.88	120 4.72	92 3.62	257 10.12	94 3.70	M16X85 $^5/_8$X$3^3/_8$	2.73 6.01	2.83 6.23
		76.1 $2^1/_2$	3450 500	70 2.75	95 3.74	124 4.88	124 4.88	92 3.62	257 10.12	103 4.06	M16X85 $^5/_8$X$3^3/_8$	2.99 6.59	3.1 6.83
		88.9 3	3450 500	89 3.50	95 3.74	124 4.88	127 5.00	92 3.62	257 10.12	120 4.72	M16X85 $^5/_8$X$3^3/_8$	3.12 6.87	3.44 7.58
		108.0 4	3450 500	114 4.50	95 3.74	126 4.96	-- --	92 3.62	257 10.12	146 5.75	M16X85 $^5/_8$X$3^3/_8$	3.38 7.44	-- --
		114.3 4	3450 500	114 4.50	95 3.74	126 4.96	-- --	92 3.62	257 10.12	146 5.75	M16X85 $^5/_8$X$3^3/_8$	3.44 7.58	-- --
168.3 6	X	33.4 1	3450 500	38 1.50	97 3.82	126 4.96	116 4.57	94 3.70	260 10.24	68 2.68	M16X85 $^5/_8$X$3^3/_8$	2.43 5.35	2.34 5.15
		42.4 $1^1/_4$	3450 500	44.5 1.75	97 3.82	126 4.96	118 4.65	94 3.70	260 10.24	74 2.91	M16X85 $^5/_8$X$3^3/_8$	2.47 5.44	2.51 5.53
		48.3 $1^1/_2$	3450 500	51 2.00	97 3.82	126 4.96	119 4.69	94 3.70	260 10.24	80 3.15	M16X85 $^5/_8$X$3^3/_8$	2.53 5.57	2.58 5.68
		60.3 2	3450 500	64 2.50	97 3.82	126 4.96	122 4.80	94 3.70	260 10.24	94 3.70	M16X85 $^5/_8$X$3^3/_8$	2.74 6.04	2.85 6.28
		73.0 $2^1/_2$	3450 500	70 2.75	97 3.82	126 4.96	124 4.88	94 3.70	260 10.24	103 4.06	M16X85 $^5/_8$X$3^3/_8$	2.96 6.52	3.15 6.94
		88.9 3	3450 500	89 3.50	97 3.82	126 4.96	129 5.08	94 3.70	260 10.24	120 4.72	M16X85 $^5/_8$X$3^3/_8$	3.13 6.89	3.44 7.58
		114.3 4	3450 500	114 4.50	97 3.82	128 5.04	-- --	94 3.70	260 10.24	146 5.75	M16X85 $^5/_8$X$3^3/_8$	3.52 7.75	-- --
219.1 8	X	33.4 1	3450 500	38 1.50	123 4.84	152 5.98	142 5.59	121 4.76	328 12.91	68 2.68	M20X115 $^3/_4$X$4^1/_2$	3.95 8.70	3.82 8.41
		42.4 $1^1/_4$	3450 500	44.5 1.75	123 4.84	152 5.98	144 5.67	121 4.76	328 12.91	74 2.91	M20X115 $^3/_4$X$4^1/_2$	3.98 8.77	4.02 8.85
		48.3 $1^1/_2$	3450 500	51 2.00	123 4.84	152 5.98	145 5.71	121 4.76	328 12.91	81 3.19	M20X115 $^3/_4$X$4^1/_2$	4.11 9.05	4.16 9.16
		60.3 2	3450 500	64 2.50	123 4.84	152 5.98	148 5.83	121 4.76	328 12.91	94 3.70	M20X115 $^3/_4$X$4^1/_2$	4.37 9.63	4.47 9.85
		73.0 $2^1/_2$	3450 500	70 2.75	123 4.84	152 5.98	152 5.98	121 4.76	328 12.91	103 4.06	M20X115 $^3/_4$X$4^1/_2$	4.56 10.04	4.74 10.44
		76.1 $2^1/_2$	3450 500	70 2.75	123 4.84	152 5.98	152 5.98	121 4.76	328 12.91	103 4.06	M20X115 $^3/_4$X$4^1/_2$	4.58 10.09	4.78 10.53
		88.9 3	3450 500	89 3.50	123 4.84	152 5.98	155 6.10	121 4.76	328 12.91	120 4.72	M20X115 $^3/_4$X$4^1/_2$	4.83 10.64	5.13 11.30
		108.0 4	3450 500	114 4.50	123 4.84	154 6.06	-- --	121 4.76	328 12.91	145 5.71	M20X115 $^3/_4$X$4^1/_2$	5.26 11.59	-- --
		114.3 4	3450 500	114 4.50	123 4.84	154 6.06	-- --	121 4.76	328 12.91	145 5.71	M20X115 $^3/_4$X$4^1/_2$	5.31 11.70	-- --

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-3L



The Model 3L Saddle-Lets is the ideal outlet fitting for making direct connections to sprinkler heads, drop nipples and or gauges. No need for welding, just cut or drill a hole at the desired outlet location. Posion the Saddle-Let so that the locating collar fits within the hole and secure with the U-bolt and nuts. The Saddle-Let allows full bore low and is pressure rates to 300 psi (20 bar).

Size			Max. Wor kPressure	Hole Size	Dimensions				Bolt/Nut Size	Approx. Wgt.
Run Pipe	X	Branch Pipe			Y	Z	V	T		
mm	X	mm	KPa	mm	mm	mm	mm	mm	mm	kg
Inches	X	Inches	PSI	Inches	Inches	Inches	Inches	Inches	Inches	Lbs.
42.4	x	21.3	2500	30.5	88	57	46	28	M10 X 68 X 38	0.32
$1^1/_4$		$^1/_2$	350	1.20	3.46	2.25	1.81	1.10	$^3/_8$ X $2^{11}/_{16}$ X $1^1/_2$	0.70
		26.9	2500	30.5	88	57	46	30	M10 X 68 X 38	0.34
		$^3/_4$	350	1.20	3.46	2.25	1.81	1.81	$^3/_8$ X $2^{11}/_{16}$ X $1^1/_2$	0.75
		33.4	2500	30.5	88	57	52	34	M10 X 68 X 38	0.40
		1	350	1.20	3.46	2.25	2.05	1.34	$^3/_8$ X $2^{11}/_{16}$ X $1^1/_2$	0.88
48.3	x	21.3	2500	30.5	88	57	45	31	M10 X 68 X 38	0.32
$1^1/_2$		$^1/_2$	350	1.20	3.46	2.25	1.77	1.22	$^3/_8$ X $2^{11}/_{16}$ X $1^1/_2$	0.70
		26.9	2500	30.5	88	57	48	33	M10 X 68 X 38	0.34
		$^3/_4$	350	1.20	3.46	2.25	1.89	1.30	$^3/_8$ X $2^{11}/_{16}$ X $1^1/_2$	0.75
		33.4	2500	30.5	88	57	55	37	M10 X 68 X 38	0.40
		1	350	1.20	3.46	2.25	2.17	1.46	$^3/_8$ X $2^{11}/_{16}$ X $1^1/_2$	0.88
60.3	x	21.3	2500	30.5	94	57	51	37	M10 X 74 X 47	0.33
2		^{1} /$_2$	350	1.20	3.70	2.25	2.00	1.46	$^3/_8$ X $2^{15}/_{16}$ X $1^7/_8$	0.73
		26.9	2500	30.5	94	57	54	39	M10 X 74 X 47	0.35
		$^3/_4$	350	1.20	3.70	2.25	2.13	1.54	$^3/_8$ X $2^{15}/_{16}$ X $1^7/_8$	0.77
		33.4	2500	30.5	94	57	61	43	M10 X 74 X 47	0.41
		1	350	1.20	3.70	2.25	2.40	1.69	$^3/_8$ X $2^{15}/_{16}$ X $1^7/_8$	0.90
73	x	21.3	2500	30.5	108	57	57	43	M10 X 89X 57	0.49
$2^1/_2$		$^1/_2$	350	1.20	4.25	2.25	2.25	1.69	$^3/_8$ X $3^1/_2$ X $2^1/_4$	1.08
		26.9	2500	30.5	108	57	60	45	M10 X 89X 57	0.51
		$^3/_4$	350	1.20	4.25	2.25	2.36	1.77	$^3/_8$ X $3^1/_2$ X $2^1/_4$	1.12
		33.4	2500	30.5	108	57	67	49	M10 X 89X 57	0.57
		1	350	1.20	4.25	2.25	2.64	1.93	$^3/_8$ X $3^1/_2$ X $2^1/_4$	1.26
76.1	x	21.3	2500	30.5	108	57	59	45	M10 X 89X 57	0.49
$2^1/_2$		$^1/_2$	350	1.20	4.25	2.25	2.32	1.77	$^3/_8$ X $3^1/_2$ X $2^1/_4$	1.08
		26.9	2500	30.5	108	57	62	47	M10 X 89X 57	0.51
		$^3/_4$	350	1.20	4.25	2.25	2.44	1.85	$^3/_8$ X $3^1/_2$ X $2^1/_4$	1.12
		33.4	2500	30.5	108	57	69	51	M10 X 89X 57	0.57
		1	350	1.20	4.25	2.25	2.72	2.00	$^3/_8$ X $3^1/_2$ X $2^1/_4$	1.26

Hole Cutting

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 in the table 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 ⅝" (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.

Fitting Coating:

Red enamel in Europe, Middle East, Africa, and India.
Orange enamel in USA
Optional: Hot dipped galvanized

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Installation Instructions:

1. Open the flange Adapter and place hinged flange around the grooved pipe end with the circular key section locating into the groove

2. Insert a standard bolt through the mating holes of the flange to secure the flange in the groove

3. Check suitability of gasket for intended service and apply a thin coat of silicone or other compatible pipe lubricant to gasket lips and outside of the gasket, if the gasket surface does not have lubricity

4. Press the gasket into cavity between the pipe OD, and flange recess.

5. Insert a standard flange bolt in the hing hole opposite the lock bolt and direct the two bolt assembly to mate with the flangeof the device to be joined

Add ghe remaining standard flange bolt and tighten all nuts evenly until faces contact firmly or bolt attain recommended joint torque values

WARNING: Depressurize and drain the piping system before attempting to install, remove, or adjust any piping products. Wear safety glasses, hardhat, and foot protection.

- Wingrou Style 321 Grooved Flange is designed to provide a rigid transition from a flanged component to a grooved piping system. Grooved
- Flanges are supplied as per ANSI Class 125 drilling pattern as standard. Other drilling patterns PN16 or ANSI Class 150 areavailable as optional.

Groove Dimensions confirm to AWWA C606.

Flange Body is made of Ductile Iron confirming to ASTM A 536 with rated working pressure up to 20 Bar / 300 PSI.

- Grooved Flanges are supplied with Flat Face as Standard. Raised Face Flange available as optional.

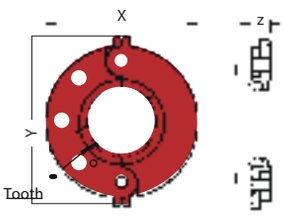
- **Wingrou Flanges are supplied with Red painted RAL 3000 as standard. Other RAL colours or Galvanised finish is available upon request.**

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Wingrou products for a particular end-use application, in accordance with industry stan¬dards and project specifications, and the applicable building codes and related regulations as well as Wingrou performance, mainte-nance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recom-mendation, advice, or opinion from any Wingrou employee, shall be deemed to alter, vary, supersede, or waive any provision of Allied Rubber and Gasket Company's standard conditions of sale, installation guide, or this disclaimer

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-321



The Wingrou Model 321 Split flange mainly use for the flange connection with the valve, equipment or pipe conversion connection to solve the groove connection and flange connection conversion, installation is simple and fast.

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Bolt tightening sequence:
it is important to make flange faces contact parallel. Tighten nuts alternately in the sequence of diagonally opposite pairs as shown below until the flange faces meet and make a metal-to metal contact.

Split flange has small triangular teeth inside the key shoulder to prevent the pipe from rotating. The teeth should be ground off when mating to a rubber-lined flange.

Split Flange require a hard flat face for effective sealing. When the mating surface is not adequate as with the serrated faces of some valves or rubber-faced wafer valves, a sandwich plate (Model 49,) must be used.

Fitting Coating:

Red enamel in Europe, Middle East, Africa, and India.
Orange enamel in USA
Optional: Hot dipped galvanized

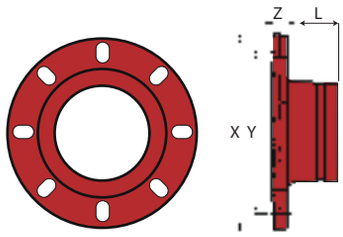
Size		Max. Work Pressure	PCD	Gasket Seat		Dimensions			Bolt/Nut Size	Approx. Wgt. Each
Nominal Dia.	Actual O.D.		c	A	B	X	Y	Z		
DN Inches	mm Inches	BAR PSI	mm inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.
50 2	60.3 2.375	20 300	120.5 4.75	64 2.520	78 3.071	165 6.496	218 8.583	20 0.787	M10X70 3/8X2 3/4	1.76 3.87
65 2 1/2	73.0 2.875	20 300	140 5.51	77 3.031	91 3.583	178 7.008	228 8.976	22 0.866	M10X70 3/8X2 3/4	2.04 4.50
65 2 1/2	76.1 3.000	20 300	140 5.51	80 3.150	94 3.701	185 7.283	238 9.370	22 0.866	M10X70 3/8X2 3/4	2.41 5.30
80 3	88.9 3.500	20 300	153 6.02	93 3.661	107 4.213	200 7.874	250 9.843	22 0.866	M10X70 3/8X2 3/4	2.55 5.62
100 4	114.3 4.500	20 300	191 7.52	119 4.685	133 5.236	229 9.016	280 11.02	24 0.945	M10X70 3/8X2 3/4	3.24 7.14
125 5	139.7 5.500	20 300	216 8.50	145 5.709	159 6.260	250 9.843	313 12.32	22 0.866	M12X70 1/2X2 3/4	3.49 7.68
125 5	141.3 5.563	20 300	216 8.50	146 5.748	160 6.299	254 10.00	321 12.64	26 1.024	M12X70 1/2X2 3/4	4.39 9.67
150 6	165.1 6.500	20 300	241 9.49	171 6.732	185 7.283	285 11.22	347 13.66	24 0.945	M12X70 1/2X2 3/4	4.55 10.02
150 6	168.3 6.625	20 300	241 9.49	174 6.850	188 7.402	285 11.22	345 13.58	26 1.024	M12X70 1/2X2 3/4	4.73 10.42
200 8	219.1 8.625	20 300	299 11.77	225 8.858	242 9.528	343 13.50	404 15.91	30 1.181	M12X70 1/2X2 3/4	6.95 15.31
250 10	273.0 10.750	20 300	362.0 14.25	275 10.83	297 11.69	407 16.02	472 18.58	28 1.101	M12 X 70 ½ X ¾	8.30 18.30
300 12	323.9 12.750	20 300	431.0 16.96	326 12.83	352 13.86	462 18.19	527 20.75	28 1.101	M12 X 70 ½ X ¾	9.80 21.60

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Wingrou products for a particular end-use application, in accordance with industry stan¬dards and project specifications, and the applicable building codes and related regulations as well as Wingrou performance, mainte-nance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recom-mendation, advice,or opinion from any Wingrou employee, shall be deemed to alter, vary, supersede, or waive any provision of Allied Rubber and Gasket Company's standard conditions of sale, installation guide, or this disclaimer

Figure-321G



The Model 321G Flange Adapter Nipple provides a rigid transition from a flanged component to a grooved system.

Confirms to class ANSI 125 lb Flange and BS 4504 class PN 16 flange drilling

Made of ductile iron confirming ASTM A-536, Every lot is metallurgi-cal examined to ensure compliance

Available with external or internal threaded ends as optional

Pressure ratings confirm to those of style 1N

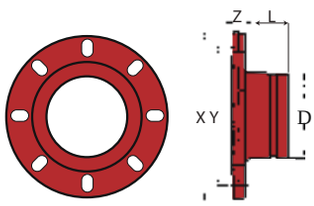
Fitting Coating:

Red enamel in Europe, Middle East, Africa, and India.
Orange enamel in USA
Optional: Hot dipped galvanized.

Size		Max. Work Pressure	L	Gasket Seat		Dimensions			Bolt/Nut Size	Approx. Wgt. Each
Nominal Dia.	Actual O.D.			A	B	X	Y	Z		
DN Inches	mm Inches	BAR PSI	mm inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	Lbs. Kg.
50 2	60.3 2.375	20 300	 2.50	64 2.520	78 3.071	165 6.50	125 4.92	16 0.63	M10X70 3/8X2 3/4	5.10 2.30
65 2 1/2	73.0 2.875	20 300	76 2.99	77 3.031	91 3.583	185 7.28	145 5.70	16 0.63	M10X70 3/8X2 3/4	6.53 2.96
65 2 1/2	76.1 3.000	20 300	76 2.99	80 3.150	94 3.701	185 7.28	145 5.70	16 0.63	M10X70 3/8X2 3/4	6.40 2.90
80 3	88.9 3.500	20 300	75 2.95	93 3.661	107 4.213	200 7.87	160 6.30	16 0.63	M10X70 3/8X2 3/4	4.79 3.39
100 4	114.3 4.500	20 300	75 2.95	119 4.685	133 5.236	225 8.86	180 7.09	16 0.63	M10X70 3/8X2 3/4	8.49 3.85
125 5	139.7 5.500	20 300	75 2.95	145 5.709	159 6.260	254 10.00	210 8.27	16 0.63	M12X70 1/2X2 3/4	14.33 6.50
125 5	141.3 5.563	20 300	75 2.95	146 5.748	160 6.299	254 10.00	210 8.27	16 0.63	M12X70 1/2X2 3/4	14.33 6.50
150 6	165.1 6.500	20 300	75 2.95	171 6.732	185 7.283	272 10.71	240 9.45	16 0.63	M12X70 1/2X2 3/4	13.86 6.30
150 6	168.3 6.625	20 300	75 2.95	174 6.850	188 7.402	272 10.71	240 9.45	16 0.63	M12X70 1/2X2 3/4	13.86 6.30
200 8	219.1 8.625	20 300	102 4.00	225 8.858	242 9.528	343 13.50	295 11.61	22 0.87	M12X70 1/2X2 3/4	30.99 13.65
250 10	273.0 10.750	20 300	102 4.00	275 10.83	297 11.69	405 15.94	355 13.97	24 0.945	M12 X 70 ½ X ¾	15.80 34.83
300 12	323.9 12.750	20 300	102 4.00	326 12.83	352 13.86	460 18.11	410 16.14	24 0.945	M12 X 70 ½ X ¾	40.34 18.30

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-321G



The Wingrou Model 321G Universal Flange Adapter provides a rigid transition from a flanged component to a grooved system. The single unit is compatible for a range of flange types including ANSI Class 125/150, PN10, PN16, and JIS 10K.

Nominal	Pipe			Y : Flange Drilling					Bolt Size		
Size in	O.D. in	L in	X in	ANSI 125 / 150 in	PN 10 / 16 in	JIS 10K in	BS 10E in	Z in	Dia in	No.	Weight Lbs
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		Kgs
2	2.375	2.50	6.50	4.75	4.92	4.72	4.49	0.63	⅝	4	5.10
50	60.3	64	165	121	125	120	114	16	M16	4	2.30
2½	2.875	2.99	7.28	5.50	5.70	5.50	5.00	0.63	⅝	4	6.53
65	73.0	76	185	140	145	140	127	16	M16	4	2.96
76.1 mm	3.000	2.99	7.28	5.50	5.70	5.50	5.00	0.63	⅝	4	6.40
	76.1	76	185	140	145	140	127	16	M16	4	2.90
3	3.500	2.95	7.87	6.00	6.30	5.90	5.75	0.63	⅝	4 / 8	7.47
80	88.9	75	200	152	160	150	146	16	M16	4 / 8	3.39
4	4.500	2.95	8.86	7.50	7.09	6.89	7.00	0.63	⅝	8	8.49
100	114.3	75	225	191	180	175	178	16	M16	8	3.85
139.7 mm	5.500	2.95	10.00	8.50	8.27	8.27	8.27	0.63	⅝ / ¾	8	14.33
	139.7	75	254	216	210	210	210	16	M16 / M20	8	6.50
5	5.563	2.95	10.00	8.50	8.27	8.27	---	0.87	⅝ / ¾	8	14.33
125	141.3	75	254	216	210	210	---	22	M16 / M20	8	6.50
165.1 mm	6.500	2.95	10.71	9.50	9.45	9.45	9.30	0.63	¾	8	13.86
	165.1	75	272	241	240	240	235	16	M20	8	6.30
6	6.625	2.95	10.71	9.50	9.45	9.45	---	0.63	¾	8	12.58
150	168.3	75	272	241	240	240	---	16	M20	8	5.72
8	8.625	4.00	13.50	11.75	11.61	11.42	11.50	0.87	¾	8 / 12	30.09
200	219.1	102	343	298	295	290	292	22	M20	8 / 12	13.65
200 JIS	8.516	4.00	13.50	11.75	11.61	11.42	---	0.87	¾	8 / 12	30.09
	216.3	102	343	298	295	290	---	22	M20	8 / 12	13.65

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

HOUSING

Wingrou Grooved Fittings Housings are made of Ductile Iron confirming to ASTM A 536 Gr. 65-45-12
Ductile iron is an ideal material for grooved mechanical components, as it provides similar or greater strength to that of wrought or cast steel materials

- Wingrou Style 355 Grooved Elbow features short center to end dimensions and it helps easier installation in less space.
- Grooved Elbow are primarily designed for fire protection applications, it can also be used for general services.
- Elbow Housings are made of Ductile Iron confirming to ASTM A 536 with rated working pressure up to 20 Bar / 300PSI.
- Wingrou Elbows are supplied with Red painted RAL 3000 as standard. Other RAL colours or Galvanised finish is available

upon request.

Chemical Properties

Percent (%)	Carbon C	Silicon Si	Manganese Mn	Phosphorous P	Sulphur S	Magnesium Mg	Chromium Cr
Min - Max	3% - 3.9%	2.5% - 3.2%	0.1% - 0.4%	0% - 0.07%	0% - 0.03%	0.03% - 0.06%	0% - 0.1%

Physical Properties

Minimum Tensile Strength	Minimum Yield Strength	Minimum Elongation (%)
448 MPa	310 MPa	12
65,000 PSI	45,000 PSI	12

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Wingrou products for a particular end-use applica-tion, in accordance with industry stan¬dards and project specifications, and the applicable building codes and related regulations as well as Wingrou performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recom-mendation, advice, or opinion from any Wingrou employee, shall be deemed to alter, vary, supersede, or waive any provision of Allied Rubber and Gasket Company's standard conditions of sale, installation guide, or this disclaimer

Note

All products to be installed in accordance with current Wingrou installation/assembly instructions. Wingrou reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

UL/FM APPROVED PRESSURE

TEMPERATURE RATING

Pipe Type	Grooved Type	Maximum Working Pressure
EN10255 M/H	Roll	20 Bar @ 38°C 300 PSI @ 100°F
Sch.40	Roll	20 Bar @ 38°C 300 PSI @ 100°F

Figure-90, 130, 180

Figure- 90S 90 STD Pattern Elbow

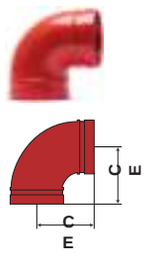


Figure- 130S STD Pattern Equal Tee

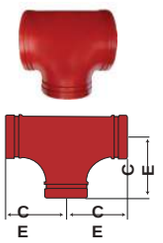
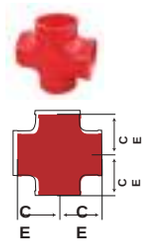


Figure- 180S STD PatternEqual Cross



Wingrou ductile iron grooved-end fittings are made of ductile iron per ASTM A536 Gr. 65-45-12

Application

- designed to provide minimum pressure drop and uniform strength

Sizes:

- 2", 2½",3od, 3", 4", 5, 6",6od, 8"10",12"

Material:

- ductile iron with rust inhibiting paint

Approvals:

- Underwriters Listed
- Factory Mutual approved

Fitting Coating:

Red enamel in Europe, Middle East, Africa, and India.
Orange enamel in USA
Optional: Hot dipped galvanized.

Working pressure and End load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Wingrou specifications.

Size		Model 90° Std. Elbow		Model 130 Std. Equal Tee		Model 180 Short Equal Cross	
Nominal Dia.	Actual O.D.	CE	Approx.Wgt.	CE	Approx. Wgt.	CE	Approx. Wgt.
DN Inches	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.	mm Inches	kg Lbs.
25 1	33.4 1.315	57 2.25	0.3 0.66	57 2.25	0.5 1.10	57 2.25	0.6 1.32
32 1 1/4	42.4 1.660	70 2.75	0.5 1.10	70 2.75	0.7 1.54	70 2.75	1.0 2.20
40 1 1/2	48.3 1.900	70 2.75	0.5 1.10	70 2.75	0.9 1.98	70 2.75	1.1 2.42
50 2	60.3 2.375	83 3.25	0.8 1.76	83 3.25	1.4 3.08	83 3.25	1.7 3.74
65 2 1/2	73.0 2.875	95 3.75	1.5 3.30	95 3.75	2.2 4.85	95 3.75	2.7 5.95
65 2 1/2	76.1 3.000	95 3.75	1.7 3.74	95 3.75	2.4 5.29	95 3.75	2.8 6.17
80 3	88.9 3.500	108 4.25	2.0 4.41	108 4.25	3.0 6.61	108 4.25	4.8 10.57
100 4	108.0 4.250	127 5.00	3.0 6.61	127 5.00	5.2 11.45	127 5.00	7.1 15.64
100 4	114.3 4.500	127 5.00	3.2 7.05	127 5.00	5.4 11.89	127 5.00	7.2 15.86
125 5	133.0 5.250	140 5.50	5.3 11.67	140 5.50	8.0 17.62	140 5.50	9.0 19.82
125 5	139.7 5.500	140 5.50	5.3 11.67	140 5.50	8.1 17.84	140 5.50	9.1 20.04
125 5	141.3 5.563	140 5.50	5.3 11.67	140 5.50	8.1 17.84	140 5.50	9.2 20.26
150 6	159.0 6.250	165 6.50	7.8 17.18	165 6.50	10.1 22.25	165 6.50	12.6 27.75
150 6	165.1 6.500	165 6.50	7.8 17.18	165 6.50	10.3 22.69	165 6.50	12.7 27.97
150 6	168.3 6.625	165 6.50	7.8 17.18	165 6.50	10.4 22.91	165 6.50	12.7 27.97
200 8	219.1 8.625	197 7.75	13.6 29.96	197 7.75	21.6 47.58	197 7.75	24.8 54.62
250 10	273.0 10.750	229 9.00	28.7 63.21	229 9.00	44.9 98.90	229 9.00	55.1 121.36
300 12	323.9 12.750	254 10.00	33.6 74.01	254 10.00	60.3 132.82	254 10.00	72.9 160.57

The allowable pipe separation dimension show is for system layout purpose only . Wingrou couplings are considered rigid connections and will not accommodate expansion or contrac-tion of the pipe system.

When assembling Wingrou couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-90S,130S,180S,

Figure- 90S 90 STD Pattern Elbow

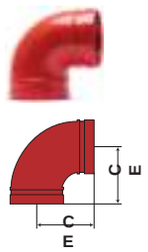


Figure- 130S STD Pattern Equal Tee

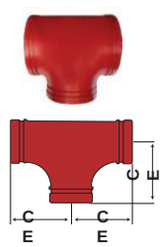
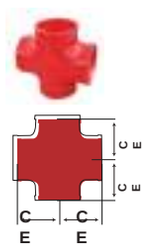


Figure- 180S STD PatternEqual Cross



Wingrou ductile iron grooved-end fittings are made of ductile iron per ASTM A536 Gr. 65-45-12

Application

- designed to provide minimum pressure drop and uniform strength

Sizes:

- 2", 2½",3od, 3", 4", 5, 6",6od, 8"10",12"

Material:

- ductile iron with rust inhibiting paint

Approvals:

- Underwriters Listed
- Factory Mutual approved

Fitting Coating:

Red enamel in Europe, Middle East, Africa, and India.
Orange enamel in USA
Optional: Hot dipped galvanized.

Working pressure and End load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Wingrou specifications.

Size		Model 90° Std. Elbow		Model 130 Std. Equal Tee		Model 180 Short Equal Cross	
Nominal Dia.	Actual O.D.	CE	Approx.Wgt.	CE	Approx. Wgt.	CE	Approx. Wgt.
DN	mm	mm	kg	mm	kg	mm	kg
Inches	Inches	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.
25	33.4	57	0.3	57	0.5	57	0.6
1	1.315	2.25	0.66	2.25	1.10	2.25	1.32
32	42.4	70	0.5	70	0.7	70	1.0
1 1/4	1.660	2.75	1.10	2.75	1.54	2.75	2.20
40	48.3	70	0.5	70	0.9	70	1.1
1 1/2	1.900	2.75	1.10	2.75	1.98	2.75	2.42
50	60.3	83	0.8	83	1.4	83	1.7
2	2.375	3.25	1.76	3.25	3.08	3.25	3.74
65	73.0	95	1.5	95	2.2	95	2.7
2 1/2	2.875	3.75	3.30	3.75	4.85	3.75	5.95
65	76.1	95	1.7	95	2.4	95	2.8
2 1/2	3.000	3.75	3.74	3.75	5.29	3.75	6.17
80	88.9	108	2.0	108	3.0	108	4.8
3	3.500	4.25	4.41	4.25	6.61	4.25	10.57
100	108.0	127	3.0	127	5.2	127	7.1
4	4.250	5.00	6.61	5.00	11.45	5.00	15.64
100	114.3	127	3.2	127	5.4	127	7.2
4	4.500	5.00	7.05	5.00	11.89	5.00	15.86
125	133.0	140	5.3	140	8.0	140	9.0
5	5.250	5.50	11.67	5.50	17.62	5.50	19.82
125	139.7	140	5.3	140	8.1	140	9.1
5	5.500	5.50	11.67	5.50	17.84	5.50	20.04
125	141.3	140	5.3	140	8.1	140	9.2
5	5.563	5.50	11.67	5.50	17.84	5.50	20.26
150	159.0	165	7.8	165	10.1	165	12.6
6	6.250	6.50	17.18	6.50	22.25	6.50	27.75
150	165.1	165	7.8	165	10.3	165	12.7
6	6.500	6.50	17.18	6.50	22.69	6.50	27.97
150	168.3	165	7.8	165	10.4	165	12.7
6	6.625	6.50	17.18	6.50	22.91	6.50	27.97
200	219.1	197	13.6	197	21.6	197	24.8
8	8.625	7.75	29.96	7.75	47.58	7.75	54.62
250	273.0	229	28.7	229	44.9	229	55.1
10	10.750	9.00	63.21	9.00	98.90	9.00	121.36
300	323.9	254	33.6	254	60.3	254	72.9
12	12.750	10.00	74.01	10.00	132.82	10.00	160.57

The allowable pipe separation dimension show is for system layout purpose only . Wingrou couplings are considered rigid connections and will not accommodate expansion or contrac-tion of the pipe system.

When assembling Wingrou couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-120,110,105

FM APPROVED c UL us LISTED

Figure- 120 45º Elbow

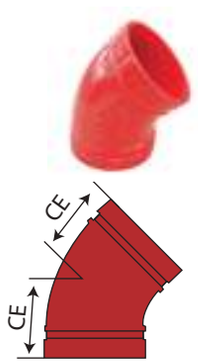


Figure- 110 22.5ºElbow

Figure- 105 11.25ºElbow

WINGROU short radius fittings, while primarily designed for fire protection applications can also be used for general service requirements.

Application

- designed to provide minimum pressure drop and uniform strength

Sizes:

- 2", 2½",3od, 3", 4", 5, 6",6od, 8"

Material:

- ductile iron with rust inhibiting paint

Approvals:

- Underwriters Listed
- Factory Mutual approved

Working pressure and End load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Wingrou specifications.

Working pressure and End load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Wingrou specifications.

The allowable pipe separation dimension show is for system layout purpose only . Wingrou couplings are considered rigid connections and will not accommodate expansion or contraction of the pipe system.

Fitting Coating:

Red enamel in Europe, Middle East, Africa, and India.
Orange enamel in USA
Optional: Hot dipped galvanized

Size		Model 120 45º Elbow		Model 110 22.5ºElbow		Model 105 11.25º Elbow	
Nominal Dia.	Actual O.D.	CE	Approx. Wgt.	CE	Approx. Wgt.	CE	Approx. Wgt.
DN Inches	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.	mm Inches	kg Lbs.
50	60.3	70	0.6	70	0.9	70	1.1
2	2.375	2.75	1.32	2.75	1.98	2.75	2.42
65	73.0	76	0.8	76	1.2	76	1.5
2 1/2	2.875	3.00	1.76	3.00	2.64	3.00	3.30
65	76.1	76	1.0	76	1.4	76	1.8
2 1/2	3.000	3.00	2.20	3.00	3.08	3.00	3.96
80	88.9	86	1.3	86	1.7	86	2.3
3	3.500	3.40	2.86	3.40	3.74	3.40	5.07
100	108.0	102	2.0	102	2.6	102	3.3
4	4.250	4.00	4.41	4.00	5.73	4.00	7.27
100	114.3	102	2.1	102	2.8	102	3.6
4	4.500	4.00	4.63	4.00	6.17	4.00	7.93
125	133.0	124	3.4	124	4.3	124	5.8
5	5.250	4.88	7.49	4.88	9.47	4.88	12.78
125	139.7	124	3.5	124	4.4	124	6.0
5	5.500	4.88	7.71	4.88	9.69	4.88	13.22
125	141.3	124	3.6	124	4.5	124	6.1
5	5.563	4.88	7.93	4.88	9.91	4.88	13.44
150	159.0	140	5.2	140	6.7	140	8.7
6	6.250	5.50	11.45	5.50	14.76	5.50	19.16
150	165.1	140	5.4	140	7.0	140	9.0
6	6.500	5.50	11.89	5.50	15.42	5.50	19.82
150	168.3	140	5.6	140	7.2	140	9.2
6	6.625	5.50	12.33	5.50	15.86	5.50	20.26
200	219.1	173	10.5	173	14.0	173	16.5
8	8.625	6.80	23.13	6.80	30.84	6.80	36.34

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-131,131R

FM APPROVED

c UL us LISTED

Figure- 131 Grooved Red. Tee

Figure- 131R Threaded Red. Tee

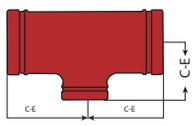


Figure- 131 Grooved Reducing Tee

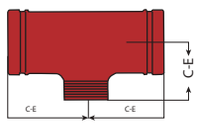


Figure-131R Threaded Reducing Tee

Size			Model 131 Reducing Tee		Model 131N Reducing Tee	
Run Pipe X Branch Pipe			CE	Approx. Wgt.	CE	Approx. Wgt.
mm X mm Inches X Inches			mm Inches	kg Lbs.	mm Inches	kg Lbs.
42.4 1¼	X	33.4 1	57 2.25	0.5 1.10	57 2.25	0.6 1.32
48.3 1½	X	33.4 1	70 2.75	0.6 1.32	70 2.75	0.6 1.32
		42.4 1¼	70 2.75	0.7 1.54	70 2.75	0.7 1.54
60.3 2	X	33.4 1	70 2.75	0.7 1.54	70 2.75	0.8 1.76
		42.4 1¼	70 2.75	0.8 1.76	70 2.75	0.8 1.76
		48.3 1½	70 2.75	0.8 1.76	70 2.75	0.8 1.76
73.0 2½	X	33.4 1	76 3.00	1.1 2.42	76 3.00	1.1 2.42
		42.4 1¼	76 3.00	1.1 2.42	76 3.00	1.1 2.42
		48.3 1½	76 3.00	1.2 2.64	76 3.00	1.2 2.64
		60.3 2	76 3.00	1.2 2.64	76 3.00	1.2 2.64
76.1 2½	X	33.4 1	76 3.00	1.2 2.64	76 3.00	1.2 2.64
		42.4 1¼	76 3.00	1.2 2.64	76 3.00	1.3 2.86
		48.3 1½	76 3.00	1.2 2.64	76 3.00	1.5 3.30
		60.3 2	76 3.00	1.2 2.64	76 3.00	1.6 3.52
88.9 3	X	33.4 1	86 3.40	1.4 3.08	86 3.40	1.4 3.08
		42.4 1¼	86 3.40	1.4 3.08	86 3.40	1.5 3.30
		48.3 1½	86 3.40	1.5 3.30	86 3.40	1.6 3.52
		73.0 2½	86 3.40	1.6 3.52	86 3.40	1.6 3.52
		76.1 2½	86 3.40	1.6 3.52	86 3.40	1.6 3.52
114.3 4	X	33.4 1	102 4.00	2.5 5.51	102 4.00	2.5 5.51

Size		Model 131 Reducing Tee		Model 131N Reducing Tee	
Run Pipe X Branch Pipe		CE	Approx. Wgt.	CE	Approx. Wgt.
mm X mm Inches X Inches		mm Inches	kg Lbs.	mm Inches	kg Lbs.
114.3 X 4	42.4 1¼	102 4.00	2.5 5.51	102 4.00	2.5 5.51
	48.3 1½	102 4.00	2.5 5.51	102 4.00	2.6 5.73
	60.3 2	102 4.00	2.6 5.73	102 4.00	2.6 5.73
	73.0 2½	102 4.00	2.6 5.73	102 4.00	2.7 5.95
	76.1 2½	102 4.00	2.6 5.73	102 4.00	2.7 5.95
	88.9 3	102 4.00	2.7 5.95	102 4.00	2.7 5.95
139.7 X 5	33.4 1	124 4.88	4.1 9.03	124 4.88	4.1 9.03
	42.4 1¼	124 4.88	4.1 9.03	124 4.88	4.2 9.25
	48.3 1½	124 4.88	4.2 9.25	124 4.88	4.3 9.47
	60.3 2	124 4.88	4.3 9.47	124 4.88	4.3 9.47
	76.1 2½	124 4.88	4.4 9.69	124 4.88	4.4 9.69
	88.9 3	124 4.88	4.5 9.91	124 4.88	4.6 10.13
	114.3 4	124 4.88	4.6 10.13	-- --	-- --
141.3 X 5	33.4 1	124 4.88	4.1 9.03	124 4.88	4.1 9.03
	42.4 1¼	124 4.88	4.1 9.03	124 4.88	4.2 9.25
	48.3 1½	124 4.88	4.2 9.25	124 4.88	4.3 9.47
	60.3 2	124 4.88	4.3 9.47	124 4.88	4.3 9.47
	73.0 2½	124 4.88	4.4 9.69	124 4.88	4.4 9.69
	88.9 3	124 4.88	4.5 9.91	124 4.88	4.6 10.13
	114.3 4	124 4.88	4.6 10.13	-- --	-- --

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-131,131R

Figure- 131 Grooved Red. Tee

Figure- 131R Threaded Red. Tee

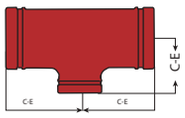


Figure- 131 Grooved Reducing Tee

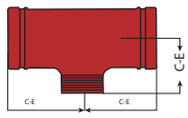


Figure-131R Threaded Reducing Tee

Size			Model 131 Reducing Tee		Model 131N Reducing Tee	
Run Pipe X Branch Pipe			CE	Approx. Wgt.	CE	Approx. Wgt.
mm X mm Inches X Inches			mm Inches	kg Lbs.	mm Inches	kg Lbs.
42.4 1¼	X	33.4 1	57 2.25	0.5 1.10	57 2.25	0.6 1.32
48.3 1½	X	33.4 1	70 2.75	0.6 1.32	70 2.75	0.6 1.32
		42.4 1¼	70 2.75	0.7 1.54	70 2.75	0.7 1.54
60.3 2	X	33.4 1	70 2.75	0.7 1.54	70 2.75	0.8 1.76
		42.4 1¼	70 2.75	0.8 1.76	70 2.75	0.8 1.76
		48.3 1½	70 2.75	0.8 1.76	70 2.75	0.8 1.76
73.0 2½	X	33.4 1	76 3.00	1.1 2.42	76 3.00	1.1 2.42
		42.4 1¼	76 3.00	1.1 2.42	76 3.00	1.1 2.42
		48.3 1½	76 3.00	1.2 2.64	76 3.00	1.2 2.64
		60.3 2	76 3.00	1.2 2.64	76 3.00	1.2 2.64
76.1 2½	X	33.4 1	76 3.00	1.2 2.64	76 3.00	1.2 2.64
		42.4 1¼	76 3.00	1.2 2.64	76 3.00	1.3 2.86
		48.3 1½	76 3.00	1.2 2.64	76 3.00	1.5 3.30
		60.3 2	76 3.00	1.2 2.64	76 3.00	1.6 3.52
88.9 3	X	33.4 1	86 3.40	1.4 3.08	86 3.40	1.4 3.08
		42.4 1¼	86 3.40	1.4 3.08	86 3.40	1.5 3.30
		48.3 1½	86 3.40	1.5 3.30	86 3.40	1.6 3.52
		73.0 2½	86 3.40	1.6 3.52	86 3.40	1.6 3.52
		76.1 2½	86 3.40	1.6 3.52	86 3.40	1.6 3.52
114.3 4	X	33.4 1	102 4.00	2.5 5.51	102 4.00	2.5 5.51

Size		Model 131 Reducing Tee		Model 131N Reducing Tee	
Run Pipe X Branch Pipe		CE	Approx. Wgt.	CE	Approx. Wgt.
mm X mm Inches X Inches		mm Inches	kg Lbs.	mm Inches	kg Lbs.
114.3 X 4	42.4 1¼	102 4.00	2.5 5.51	102 4.00	2.5 5.51
	48.3 1½	102 4.00	2.5 5.51	102 4.00	2.6 5.73
	60.3 2	102 4.00	2.6 5.73	102 4.00	2.6 5.73
	73.0 2½	102 4.00	2.6 5.73	102 4.00	2.7 5.95
	76.1 2½	102 4.00	2.6 5.73	102 4.00	2.7 5.95
	88.9 3	102 4.00	2.7 5.95	102 4.00	2.7 5.95
139.7 X 5	33.4 1	124 4.88	4.1 9.03	124 4.88	4.1 9.03
	42.4 1¼	124 4.88	4.1 9.03	124 4.88	4.2 9.25
	48.3 1½	124 4.88	4.2 9.25	124 4.88	4.3 9.47
	60.3 2	124 4.88	4.3 9.47	124 4.88	4.3 9.47
	76.1 2½	124 4.88	4.4 9.69	124 4.88	4.4 9.69
	88.9 3	124 4.88	4.5 9.91	124 4.88	4.6 10.13
	114.3 4	124 4.88	4.6 10.13	-- --	-- --
141.3 X 5	33.4 1	124 4.88	4.1 9.03	124 4.88	4.1 9.03
	42.4 1¼	124 4.88	4.1 9.03	124 4.88	4.2 9.25
	48.3 1½	124 4.88	4.2 9.25	124 4.88	4.3 9.47
	60.3 2	124 4.88	4.3 9.47	124 4.88	4.3 9.47
	73.0 2½	124 4.88	4.4 9.69	124 4.88	4.4 9.69
	88.9 3	124 4.88	4.5 9.91	124 4.88	4.6 10.13
	114.3 4	124 4.88	4.6 10.13	-- --	-- --

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-240,240N

Figure-240
Concentric Reducer

Figure- 240N
Concentric Reducer

Figure- 240
Concentric Reducer

Figure- 240N Threaded
Concentric Reducer

Size			Model 240 Concentric Reducer		Model 240N Concentric Reducer	
Run Pipe	X	Branch Pipe	EE	Approx. Wgt.	EE	Approx. Wgt.
mm Inches	X	mm Inches	mm Inches	kg Lbs.	mm	kg Lbs.
42.4 1 1/4	X	33.4 1	64 2.50	0.2 0.44	64 2.50	0.3 0.66
48.3 1 1/2	X	33.4 1	64 2.50	0.3 0.66	64 2.50	0.3 0.66
		42.4 1 1/4	64 2.50	0.3 0.66	64 2.50	0.4 0.88
60.3 2	X	33.4 1	64 2.50	0.3 0.66	64 2.50	0.4 0.88
		42.4 1 1/4	64 2.50	0.4 0.88	64 2.50	0.4 0.88
		48.3 1 1/2	64 2.50	0.4 0.88	64 2.50	0.4 0.88
73.0 2 1/2	X	33.4 1	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		42.4 1 1/4	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		48.3 1 1/2	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		60.3 2	64 2.50	0.5 1.10	64 2.50	0.5 1.10
76.1 2 1/2	X	33.4 1	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		42.4 1 1/4	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		48.3 1 1/2	64 2.50	0.5 1.10	64 2.50	0.6 1.32
		60.3 2	64 2.50	0.6 1.32	64 2.50	0.6 1.32
88.9 3	X	33.4 1	64 2.50	0.6 1.32	64 2.50	0.6 1.32
		42.4 1 1/4	64 2.50	0.6 1.32	64 2.50	0.6 1.32
		48.3 1 1/2	64 2.50	0.6 1.32	64 2.50	0.7 1.54
		60.3 2	64 2.50	0.7 1.54	64 2.50	0.7 1.54
		73.0 2 1/2	64 2.50	0.7 1.54	64 2.50	0.7 1.54
		76.1 2 1/2	64 2.50	0.7 1.54	64 2.50	0.7 1.54
114.3 4	X	33.4 1	76 3.00	0.9 1.98	76 3.00	0.9 1.98

Size			Model 240 Concentric Reducer		Model 240N Concentric Reducer	
Run Pipe	X	Branch Pipe	EE	Approx. Wgt.	EE	Approx. Wgt.
mm Inches	X	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.
114.3 4	X	42.4 1 1/4	76 3.00	0.9 1.98	76 3.00	1.0 2.20
		48.3 1 1/2	76 3.00	1.0 2.20	76 3.00	1.0 2.20
		60.3 2	76 3.00	1.0 2.20	76 3.00	1.1 2.42
		73.0 2 1/2	76 3.00	1.1 2.42	76 3.00	1.1 2.42
		76.1 2 1/2	76 3.00	1.1 2.42	76 3.00	1.1 2.42
		88.9 3	76 3.00	1.1 2.42	76 3.00	1.1 2.42
139.7 5	X	33.4 1	89 3.50	1.4 3.08	89 3.50	1.4 3.08
		42.4 1 1/4	89 3.50	1.4 3.08	89 3.50	1.4 3.08
		48.3 1 1/2	89 3.50	1.4 3.08	89 3.50	1.5 3.30
		60.3 2	89 3.50	1.5 3.30	89 3.50	1.5 3.30
		76.1 2 1/2	89 3.50	1.5 3.30	89 3.50	1.6 3.52
		88.9 3	89 3.50	1.6 3.52	89 3.50	1.6 3.52
		114.3 4	89 3.50	1.7 3.74	-- --	-- --
141.3 5	X	33.4 1	89 3.50	1.4 3.08	89 3.50	1.4 3.08
		42.4 1 1/4	89 3.50	1.4 3.08	89 3.50	1.4 3.08
		48.3 1 1/2	89 3.50	1.4 3.08	89 3.50	1.5 3.30
		60.3 2	89 3.50	1.5 3.30	89 3.50	1.5 3.30
		73.0 2 1/2	89 3.50	1.5 3.30	89 3.50	1.6 3.52
		88.9 3	89 3.50	1.6 3.52	89 3.50	1.6 3.52
		114.3 4	89 3.50	1.7 3.74	-- --	-- --

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure- 240,240N

Figure-240 Concentric Reducer

Figure-240N Concentric Reducer

Figure-240 Concentric Reducer

Figure- 240N Concentric Reducer

Size			Model 240 Concentric Reducer		Model 240N Concentric Reducer	
Run Pipe	X	Branch Pipe	EE	Approx. Wgt.	EE	Approx. Wgt.
mm Inches	X	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.
165.1 6	X	33.4 1	102 4.00	2.1 4.66	102 4.00	2.1 4.66
		42.4 1 1/4	102 4.00	2.1 4.66	102 4.00	2.2 4.85
		48.3 1 1/2	102 4.00	2.2 4.85	102 4.00	2.2 4.85
		60.3 2	102 4.00	2.2 4.85	102 4.00	2.3 5.07
		76.1 2 1/2	102 4.00	2.3 5.07	102 4.00	2.3 5.07
		88.9 3	102 4.00	2.3 5.07	102 4.00	2.4 5.29
		114.3 4	102 4.00	2.4 5.29	-- --	-- --
		139.7 5	102 4.00	2.7 5.99	-- --	-- --
168.3 6	X	33.4 1	102 4.00	2.1 4.66	102 4.00	2.2 4.85
		42.4 1 1/4	102 4.00	2.1 4.66	102 4.00	2.2 4.85
		48.3 1 1/2	102 4.00	2.2 4.85	102 4.00	2.2 4.85
		60.3 2	102 4.00	2.2 4.85	102 4.00	2.3 5.07
		73.0 2 1/2	102 4.00	2.3 5.07	102 4.00	2.3 5.07
		88.9 3	102 4.00	2.3 5.07	102 4.00	2.4 5.29
		114.3 4	102 4.00	2.4 5.29	-- --	-- --
		141.3 5	102 4.00	2.7 5.99	-- --	-- --
219.1 8	X	33.4 1	127 5.00	4.1 9.03	127 5.00	4.2 9.25
		42.4 1 1/4	127 5.00	4.2 9.25	127 5.00	4.3 9.47
		48.3 1 1/2	127 5.00	4.2 9.25	127 5.00	4.3 9.47
		60.3 2	127 5.00	4.3 9.47	127 5.00	4.4 9.69
		73.0 2 1/2	127 5.00	4.3 9.47	127 5.00	4.4 9.69

Size			Model 240 Concentric Reducer		Model 240N Concentric Reducer	
Branch Pipe			EE	Approx. Wgt.	EE	Approx. Wgt.
mm Inches	X	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.
219.1 8	X	76.1 2 1/2	127 5.00	4.3 9.47	127 5.00	4.5 9.91
		88.9 3	127 5.00	4.5 9.91	127 5.00	4.5 9.91
		114.3 4	127 5.00	4.6 10.13	-- --	-- --
		139.7 5	127 5.00	4.8 10.57	-- --	-- --
		141.3 5	127 5.00	4.8 10.57	-- --	-- --
		165.1 6	127 5.00	5.0 11.00	-- --	-- --
		168.3 6	127 5.00	5.0 11.00	-- --	-- --
273.0 10	X	114.3 4	152 6.00	7.5 16.52	-- --	-- --
		139.7 5	152 6.00	7.6 16.74	-- --	-- --
		141.3 5	152 6.00	7.6 16.74	-- --	-- --
		165.1 6	152 6.00	7.8 17.18	-- --	-- --
		168.3 6	152 6.00	7.8 17.18	-- --	-- --
		219.1 8	152 6.00	8.8 19.38	-- --	-- --
323.9 12	X	114.3 4	178 7.00	9.9 21.81	-- --	-- --
		139.7 5	178 7.00	10.0 22.03	-- --	-- --
		141.3 5	178 7.00	10.0 22.03	-- --	-- --
		165.1 6	178 7.00	10.2 22.47	-- --	-- --
		168.3 6	178 7.00	10.3 22.69	-- --	-- --
		219.1 8	178 7.00	11.2 24.67	-- --	-- --
		273.0 10	178 7.00	13.8 30.40	-- --	-- --

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-230,230N

Model 230 Eccentric Reducer

Model 230N ThreadedConcentric Reducer

Model 230 Eccentric Reducer

Model 230N Threaded Concentric Reducer

Size		Model 230 Eccentric Reducer		Model 230N Eccentric Reducer	
Run Pipe X Branch Pipe		EE	Approx. Wgt.	EE	Approx. Wgt.
mm X mm Inches X Inches		mm Inches	kg Lbs.	mm Inches	kg Lbs.
42.4 1 1/4	X 33.4 1	64 2.50	0.2 0.44	64 2.50	0.3 0.66
48.3 1 1/2	X 33.4 1	64 2.50	0.3 0.66	64 2.50	0.3 0.66
	42.4 1 1/4	64 2.50	0.3 0.66	64 2.50	0.4 0.88
60.3 2	X 33.4 1	64 2.50	0.3 0.66	64 2.50	0.4 0.88
	42.4 1 1/4	64 2.50	0.4 0.88	64 2.50	0.4 0.88
	48.3 1 1/2	64 2.50	0.4 0.88	64 2.50	0.4 0.88
73.0 2 1/2	X 33.4 1	64 2.50	0.5 1.10	64 2.50	0.5 1.10
	42.4 1 1/4	64 2.50	0.5 1.10	64 2.50	0.5 1.10
	48.3 1 1/2	64 2.50	0.5 1.10	64 2.50	0.5 1.10
	60.3 2	64 2.50	0.5 1.10	64 2.50	0.5 1.10
76.1 2 1/2	X 33.4 1	64 2.50	0.5 1.10	64 2.50	0.5 1.10
	42.4 1 1/4	64 2.50	0.5 1.10	64 2.50	0.5 1.10
	48.3 1 1/2	64 2.50	0.5 1.10	64 2.50	0.6 1.32
	60.3 2	64 2.50	0.6 1.32	64 2.50	0.6 1.32
88.9 3	X 33.4 1	64 2.50	0.6 1.32	64 2.50	0.6 1.32
	42.4 1 1/4	64 2.50	0.6 1.32	64 2.50	0.6 1.32
	48.3 1 1/2	64 2.50	0.6 1.32	64 2.50	0.7 1.54
	60.3 2	64 2.50	0.7 1.54	64 2.50	0.7 1.54
108.0 4	X 33.4 1	76 3.00	0.9 1.98	76 3.00	0.9 1.98
	42.4 1 1/4	76 3.00	0.9 1.98	76 3.00	1.0 2.20
	48.3 1 1/2	76 3.00	1.0 2.20	76 3.00	1.0 2.20

Size		Model 230 Eccentric Reducer		Model 230N Eccentric Reducer	
Run Pipe X Branch Pipe		EE	Approx. Wgt.	EE	Approx. Wgt.
mm X m Inches X Inches		mm Inches	kg Lbs.	mm Inches	kg Lbs.
108.0 4	X 33.4 1	76 3.00	0.9 1.98	76 3.00	0.9 1.98
	42.4 1 1/4	76 3.00	0.9 1.98	76 3.00	1.0 2.20
	48.3 1 1/2	76 3.00	1.0 2.20	76 3.00	1.0 2.20
	60.3 2	76 3.00	1.0 2.20	76 3.00	1.1 2.42
	76.1 2 1/2	76 3.00	1.1 2.42	76 3.00	1.1 2.42
	88.9 3	76 3.00	1.1 2.42	76 3.00	1.1 2.42
114.3 4	X 33.4 1	76 3.00	0.9 1.98	76 3.00	0.9 1.98
	42.4 1 1/4	76 3.00	0.9 1.98	76 3.00	1.0 2.20
	48.3 1 1/2	76 3.00	1.0 2.20	76 3.00	1.0 2.20
	60.3 2	76 3.00	1.0 2.20	76 3.00	1.1 2.42
	73.0 2 1/2	76 3.00	1.1 2.42	76 3.00	1.1 2.42
	76.1 2 1/2	76 3.00	1.1 2.42	76 3.00	1.1 2.42
	88.9 3	76 3.00	1.1 2.42	76 3.00	1.1 2.42
139.7 5	X 60.3 2	89 3.50	1.5 3.30	89 3.50	1.5 3.30
	76.1 2 1/2	89 3.50	1.5 3.30	89 3.50	1.5 3.30
	88.9 3	89 3.50	1.6 3.52	89 3.50	1.6 3.52
	108.0 4	89 3.50	1.7 3.74	-- --	-- --
	114.3 4	89 3.50	1.7 3.74	-- --	-- --
141.3 5	X 60.3 2	89 3.50	1.5 3.30	89 3.50	1.5 3.30
	73.0 2 1/2	89 3.50	1.5 3.30	89 3.50	1.6 3.52
	88.9 3	89 3.50	1.6 3.52	89 3.50	1.6 3.52
	114.3 4	89 3.50	1.7 3.74	-- --	-- --

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-230,230N

Model 230 Eccentric Reducer

Model 230N Threaded Concentric Reducer

Model 230 Eccentric Reducer

Model 230N Threaded Concentric Reducer

Size		Model 240 Concentric Reducer		Model 240N Concentric Reducer	
Run Pipe X Branch Pipe		EE	Approx. Wgt.	EE	Approx. Wgt.
mm X mm Inches X Inches		mm Inches	kg Lbs.	mm Inches	kg Lbs.
165.1 6	X 60.3 2	102 4.00	2.2 4.85	102 4.00	2.3 5.07
	76.1 2 1/2	102 4.00	2.3 5.07	102 4.00	2.3 5.07
	88.9 3	102 4.00	2.3 5.07	102 4.00	2.4 5.29
	114.3 4	102 4.00	2.4 5.29	-- --	-- --
	139.7 5	102 4.00	2.7 5.99	-- --	-- --
168.3 6	X 60.3 2	102 4.00	2.2 4.85	102 4.00	2.3 5.07
	73.0 2 1/2	102 4.00	2.3 5.07	102 4.00	2.3 5.07
	88.9 3	102 4.00	2.3 5.07	102 4.00	2.4 5.29
	114.3 4	102 4.00	2.4 5.29	-- --	-- --
	141.3 5	102 4.00	2.7 5.99	-- --	-- --
219.1 8	X 60.3 2	127 5.00	4.3 9.47	127 5.00	4.4 9.69
	73.0 2 1/2	127 5.00	4.3 9.47	127 5.00	4.4 9.69
	88.9 3	127 5.00	4.5 9.91	127 5.00	4.5 9.91
	108.0 4	127 5.00	4.6 10.13	-- --	-- --
	133.0 5	127 5.00	4.8 10.57	-- --	-- --
	139.7 5	127 5.00	4.8 10.57	-- --	-- --
	141.3 5	127 5.00	4.8 10.57	-- --	-- --
	159.0 6	127 5.00	5.0 11.00	-- --	-- --
	165.1 6	127 5.00	5.0 11.00	-- --	-- --
	168.3 6	127 5.00	5.0 11.00	-- --	-- --

Size		Model 230 Eccentric Reducer		Model 230N Eccentric Reducer	
Run Pipe X Branch Pipe		EE	Approx. Wgt.	EE	Approx. Wgt.
mm X mm Inches X Inches		mm Inches	kg Lbs.	mm Inches	kg Lbs.
273.0 10	X 108.0 4	152 6.00	7.5 16.52	-- --	-- --
	114.3 4	152 6.00	7.5 16.52	-- --	-- --
	133.0 5	152 6.00	7.6 16.74	-- --	-- --
	139.7 5	152 6.00	7.6 16.74	-- --	-- --
	141.3 5	152 6.00	7.6 16.74	-- --	-- --
	159.0 6	152 6.00	7.8 17.18	-- --	-- --
	165.1 6	152 6.00	7.8 17.18	-- --	-- --
	168.3 6	152 6.00	7.8 17.18	-- --	-- --
	219.1 8	152 6.00	8.8 19.38	-- --	-- --
323.9 12	X 108.0 4	178 7.00	9.9 21.81	-- --	-- --
	114.3 4	178 7.00	9.9 21.81	-- --	-- --
	133.0 5	178 7.00	10.0 22.03	-- --	-- --
	139.7 5	178 7.00	10.0 22.03	-- --	-- --
	141.3 5	178 7.00	10.0 22.03	-- --	-- --
	159.0 6	178 7.00	10.2 22.47	-- --	-- --
	165.1 6	178 7.00	10.2 22.47	-- --	-- --
	168.3 6	178 7.00	10.3 22.69	-- --	-- --
	219.1 8	178 7.00	11.2 24.67	-- --	-- --
	273.0 10	178 7.00	13.8 30.40	-- --	-- --

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Figure-300,300CH,300EH

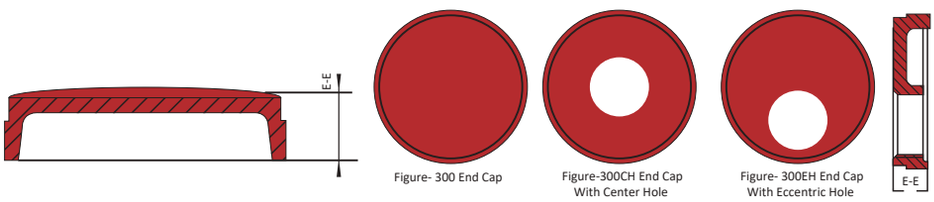


Figure- 300 End Cap

Figure-300CH End Cap With Center Hole

Figure- 300EH End Cap With Eccentric Hole

Wingrou Model 300EH End Cap with hole is an ideal transition fittings when a large reduction is required such as 6 x 1", 4 x 1"Etc.
The model 300EH can be used as an alterna ve to expensive swaged nipple

Figure-300 End Cap

Figure- 300EH Transition Cap

Figure- 300CH End Cap With Center Hole

Size		Model 300 End Cap		Model 300CH End Cap With Center Hole		Model 300EH End Cap With Eccentric Hole	
Nominal Dia.	Actual O.D.	T	Approx. Wgt.	T	Approx. Wgt.	T	Approx. Wgt.
DN Inches	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.	mm Inches	kg Lbs.
25 1	33.4 1.315	28 1.10	0.1 0.22	--- ---	--- ---	--- ---	--- ---
32 1 1/4	424. 1.660	28 1.10	0.13 0.29	--- ---	--- ---	--- ---	--- ---
40 1 1/2	48.3 1.900	28 1.10	0.15 0.33	--- ---	--- ---	--- ---	--- ---
50 2	60.3 2.375	37 1.46	0.22 0.48	25 1.00	0.31 0.68	25 1.00	0.25 0.55
65 2 1/2	73.0 2.875	37 1.46	0.3 0.66	25 1.00	0.36 0.79	25 1.00	0.36 0.79
65 2 1/2	76.1 3.000	37 1.46	0.32 0.7	25 1.00	0.38 0.84	25 1.00	0.38 0.84
80 3	88.9 3.500	41 1.61	0.41 0.9	25 1.00	0.52 1.15	25 1.00	0.52 1.15
100 4	108.0 4.250	51 2.00	0.69 1.52	25 1.00	0.8 1.76	25 1.00	0.8 1.76
100 4	114.3 4.500	51 2.00	0.71 1.56	25 1.00	0.82 1.81	25 1.00	0.82 1.81
125 5	133.0 5.250	51 2.00	1.04 2.29	25 1.00	1.15 2.53	25 1.00	1.15 2.53
125 5	139.7 5.500	51 2.00	1.11 2.44	25 1.00	1.23 2.71	25 1.00	1.23 2.71
125 5	141.3 5.563	51 2.00	1.12 2.47	25 1.00	1.24 2.73	25 1.00	1.24 2.73
150 6	159.0 6.250	55 2.17	1.38 3.04	25 1.00	1.56 3.44	25 1.00	1.56 3.44
150 6	165.1 6.500	55 2.17	1.45 3.19	25 1.00	1.68 3.7	25 1.00	1.68 3.7
150 6	168.3 6.625	55 2.17	1.51 3.33	25 1.00	1.72 3.79	25 1.00	1.72 3.79
200 8	219.1 8.625	68 13.00	3.13 6.89	30 1.18	3.71 8.17	30 1.18	3.71 8.17
250 10	273.0 10.750	75 2.95	5.52 12.16	32 1.25	6.17 13.59	32 1.25	6.17 13.59
300 12	323.9 12.750	81 3.20	8.44 18.59	32 1.25	9.73 21.43	32 1.25	9.73 21.43

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

Expansion Joint

The Model 1N and 1NH Expansion Joint is a combination of couplings and specially machined pipe nipples that are joined in a series to accommodate the expansion and contraction of a piping system. Standard units are comprised of either Model 1N and 1NH flexible couplings units are also available. The components are epoxy coated (RAL3000 red) for ease of use and longer life. The Model 1N is designed only for use on straight pipe runs and require independent supports and or guides to prevent deflection.

Function

- Allows for linear/axial expansion and compression within a piping system.
- Provides increased linear movement capabilities when compared to standard flexible grooved joints.

PRODUCT DESCRIPTION

Available Sizes

- 11/2" – 12"/DN40 – DN300

Pipe Material

- Carbon steel

Material Gaske

- EPDM Gasket

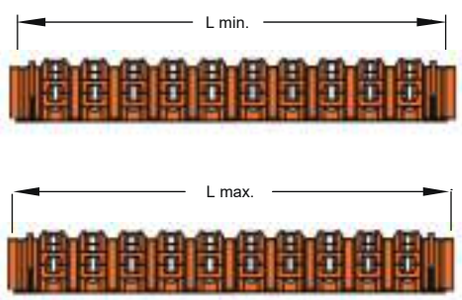
Fitting Coating:

RAL 3000Red Paint Europe, Middle East, Africa, and India.
Orange enamel in USA
Optional: Hot dipped galvanized.

Coatings

Housings (specify choice):

Red enamel in Europe, Middle East, Africa, and India.
Orange enamel in USA
Optional: Hot dipped galvanized.



Housing:

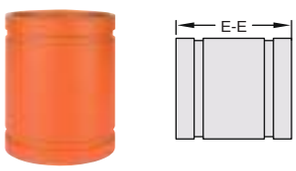
Standard: Ductile iron conforming to ASTM A536, Grade 65-45-12.

Nominal Size in mm	Pipe O.D. in mm	Couplings (Standard Units) Model No. No.	Max. Working Pressure PSI Bar	Max. Movement in mm	L - (ref.) Min. (Compressed) (Expanded) in mm	L - (ref.) Max. in mm	Weight Lbs Kgs
1½ 40	1.900 48.3	1N / 1NH 10	350 24	2.91 74	28.25 718	31.18 792	24.2 11.0
2 50	2.375 60.3	1N / 1NH 10	350 24	3.11 79	28.25 718	31.38 797	27.0 12.2
2½ 65	2.875 73.0	1N / 1NH 10	350 24	3.11 79	28.25 718	31.38 797	36.0 16.3
76.1 mm	3.000 76.1	1N / 1NH 10	350 24	3.11 79	28.25 718	31.38 797	36.0 16.3
3 80	3.500 88.9	1N / 1NH 10	350 24	3.11 79	28.25 718	31.38 797	46.0 20.9
4 100	4.500 114.3	1N / 1NH 7	350 24	2.09 53	26.50 673	28.58 726	36.5 16.6
133.0 mm	5.250 133.0	1N / 1NH 7	350 24	2.09 53	26.50 673	28.58 726	72.0 32.7
165.1 mm	6.500 165.1	1N / 1NH 7	350 24	2.09 53	26.26 667	28.35 720	58.1 26.4
6 150	6.625 168.3	1N / 1NH 7	350 24	2.09 53	26.26 667	28.35 720	91.1 41.4
8 200	8.625 219.1	71N / 1NH 7	350 24	1.93 49	28.50 724	30.43 773	159.7 72.6
10 250	10.750 273.0	1N / 1NH 7	350 24	3.46 88	33.03 839	36.46 926	257.2 116.9
12 300	12.750 323.9	1N / 1NH 7	350 24	3.19 81	33.31 846	36.46 926	373.0 169.3

* Working pressure is based on connection with roll- or cut-grooved standard wall carbon steel pipe.

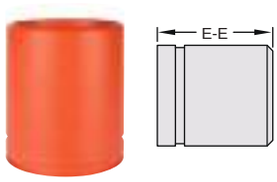
Wingrou standard fitting pressure ratings conform to the ratings of Model 1GS couplings. Material: Carbon steel Sch. 40 pipe to ASTM A53 Surface Finish: Black

Grooved x Grooved



Gr. x Gr.

Grooved x Bevel



Gr. x Bev.

Groove x Thread

Gr. x Th

Nominal Pipe Size in mm	Pipe O.D. in mm	(Gr x Gr) E - E in mm	(Gr x Gr) Weight Lbs Kgs	(Gr x Bev) E - E in mm	(Gr x Bev) Weight Lbs Kgs	(Gr x Th) E - E in mm	(Gr x Th) Weight Lbs Kgs
¾ 20	1.050 26.7	3 76	0.29 0.13	3 76	0.29 0.13	3 76	0.29 0.13
1 25	1.315 33.4	3 76	0.42 0.19	3 76	0.42 0.19	3 76	0.42 0.19
1¼ 32	1.660 42.2	4 102	0.68 0.31	4 102	0.70 0.32	4 102	0.66 0.30
1½ 40	1.900 48.3	4 102	0.82 0.37	4 102	0.84 0.38	4 102	0.79 0.36
2 50	2.375 60.3	4 102	1.10 0.50	4 102	1.10 0.50	4 102	1.10 0.50
2½ 65	2.875 73.0	4 102	1.76 0.80	4 102	1.76 0.80	4 102	1.54 0.72
76.1 mm	3.000 76.1	4 102	1.98 0.90	4 102	1.98 0.90	4 102	1.98 0.90
3 80	3.500 88.9	4 102	2.40 1.10	4 102	2.40 1.10	4 102	2.20 1.00
4 100	4.500 114.3	6 152	5.17 2.35	6 152	5.17 2.35	6 152	4.84 2.20
5 125	5.563 141.3	6 152	7.26 3.30	6 152	7.26 3.30	6 152	6.60 3.00
139.7 mm	5.500 139.7	6 152	7.26 3.30	6 152	7.26 3.30	6 152	6.60 3.00
6 150	6.625 168.3	6 152	9.90 4.50	6 152	9.90 4.50	6 152	9.81 4.46
165.1 mm	6.500 165.1	6 152	9.46 4.30	6 152	9.46 4.30	6 152	9.81 4.46
8 200	8.625 219.1	6 152	14.30 6.50	6 152	14.30 6.50	--- ---	--- ---
10 250	10.750 273.0	8 203	27.06 12.30	8 203	19.00 8.66	--- ---	--- ---
12 300	12.750 323.9	8 203	35.64 16.20	8 203	22.35 10.16	--- ---	--- ---

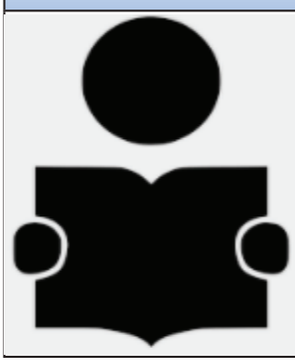
Note: Specify male thread or female thread when ordering

General Notes: Pressure Ratings for fittings conform to the working pressure of the coupling used to join the system.
Listed and or Approved: Pressures are pressure ratings for fire protection systems,
Field Joint Test: For one time only the system may be tested hydrostatically at 1½ times the maximum working pressure listed Warning: Piping systems must always be depressurized and drained before attempting disassembly and or removal of any components.

Maximum working pressure for the fire protection application, approved pressure by related authorities should be used. UL/ULC 300 Psi 2065 kPa/21bars FM 300Psi 2065kPa/21 Bars

The grooved piping method is based upon the proper preparation of grooves to receive the housings' keys. The groove serves as a recess in the pipe, which allows ample depth for secure engagement of the housings, yet ample wall thickness for full published Wingrou pressure ratings

WARNING



- **Before setting up and operating any Wingrou pipe preparation tools, read and understand the operating and maintenance instructions manual for the tool.**
- **Learn the operation, applications, and potential hazards peculiar to the tool.**

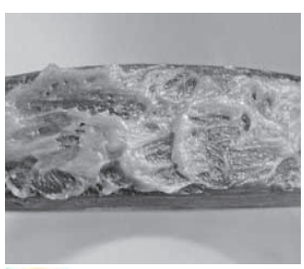
Failure to follow these instructions could cause improper product installation, resulting in serious personal injury and/or property damage.

LUBRICATION

Lubrication of the gasket with a thin coating of Lubricant compatible material on the exterior/gasket sealing lips or the coupling housings' interiors/pipe ends is essential to prevent gasket pinching. In addition, lubrication eases installation of the gasket onto the pipe end. Refer to the photos below for examples of properly and improperly lubricated gaskets.

Normal Gasket

Properly Lubricated gasket with thin coating of lubricated



Improperly Lubricated Gasket

PIPE LENGTHS SUITABLE FOR GROOVING

The table below identifies the minimum pipe lengths that can be grooved safely by using Wingrou Grooving Tools. In addition, this table identifies the maximum pipe lengths that can be grooved without the use of a pipe stand. Pipe that exceeds the maximum lengths listed in this table requires the use of a pipe stand. Always refer to the operating and maintenance manual for the applicable grooving tool for proper setup and grooving techniques.

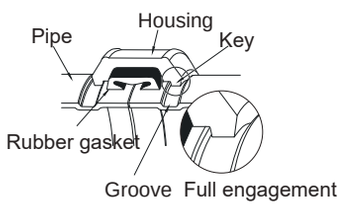
Pipe Lengths Suitable For Grooving

Size		Length - inches/mm	
Nominal Size inches or mm	Actual Pipe Outside Diameter inches/mm	Minimum	Maximum
1	1.315 33.7	8 205	36 915
1 ¼	1.660 42.4	8 205	36 915
1 ½	1.900 48.3	8 205	36 915
2	2.375 60.3	8 205	36 915
2 ½	2.875 73.0	8 205	36 915
76.1 mm	3.000 76.1	8 205	36 915
3	3.500 88.9	8 205	36 915
4	4.500 114.3	8 205	36 915
139.7 mm	5.500 139.7	8 205	32 815
5	5.563 141.3	8 205	32 815
165.1 mm	6.500 165.1	10 255	30 765
6	6.625 168.3	10 255	28 715
8	8.625 219.1	10 255	24 610
10	10.750 273.0	10 255	20 510
12	12.750 323.9	12 305	18 460

PIPE END PREPARATION

How to process roll-grooves

Wingrou grooved piping systems require the processing of a roll or cut groove to the pipe ends being connected. The engagement of the housing keys in the grooves is integral in providing a secure and leak-tight joint. It is essential that the grooves are properly processed for optimum joint performance.



Nominal pipe size

Wingrou couplings and fittings are identified by the nominal (IPS) pipe size in inches or nominal diameter of pipe (DN) in millimeters. Always check the actual O.D. of the pipe and fittings to be connected, as in some markets it is customary to refer to different O.D. pipes with the same nominal size.

Roll groove standard

Roll grooves must meet the specifications and requirements of ANSI/ AWWA C-606-04 For other pipe sizes not specified in this standard, refer to the applicable groove specifications shown in this catalog.

Applicable pipe wall thickness

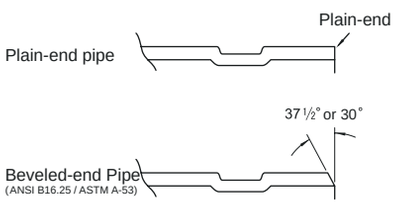
Roll grooves are generally applicable to .375”/9.5mm thick or thinner wall carbon steel pipe, stainless steel pipe, copper tube, aluminum pipe and PVC pipe depending on the type of roll-grooving machine and roll set being used. Different wall thicknesses and sizes require the use of different roll sets as with Sch. 10 and Sch. 40 pipe as shown.

IPS Sizes - Inches		Metric Sizes - millimeters	
Nominal size	Actual size	Nominal size	Actual size
1	1.315	25	33.4
1-1/4	1.660	32	42.2
1-1/2	1.900	40	48.3
2	2.375	50	60.3
2-1/2	2.875	65	73.0
3	3.500	80	88.9
4	4.500	100	114.3
5	5.563	125	141.3
6	6.625	150	168.3
8	8.625	200	219.1
10	10.750	250	273.0

Comparative Advantages	*Threaded*	*Flanged*	*Welded*	***Grooved***
Allows angular deflection-misalignment	---	---	---	✓
Reclaimable, contraction or, no need for expansion joint	---	---	---	✓
Reclaimable, no need for union	---	✓	---	✓
Allows fast connection with valves	---	---	---	✓
Allows rotation of pipe for alignment	---	✓	---	✓
No special skills required to assemble	---	---	---	✓
No welding slags	✓	---	---	✓
No weakening of pipe at joints	✓	---	---	✓
No fire hazard during installation	---	✓	---	✓
	✓	✓	✓	✓
Speed of installation	✓	---	---	✓
Allows prefabrication	✓	✓	---	✓
Low installation cost		---	---	✓

PLAIN END PIPE AND BEVELED END PIPE

While plain-end pipe is preferred, the use of beveled end pipe is acceptable providing that the wall thickness is .375”/9.5mm or thinner and the bevel is 37-1/2 ±2-1/2° or 30° as specified in ANSI B16.25 and ASTM A-53 respectively.

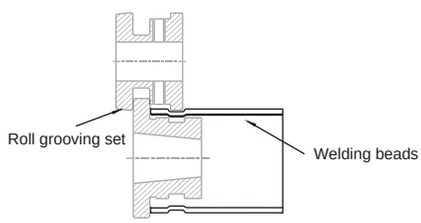


ERW Pipe

ERW pipe is one of the most popular types of pipe used today.Depending on the individual pipe and manufacturer, welding beadsmay remain on the surface (inside and outside) of the pipe. Always
remove harmful weld beads near the pipe ends as they can causerattling of the roll grooving machine resulting in inaccurate grooves.

Wingrou Model No. TWG-IIAB

Ref. page No.51



Weld beads

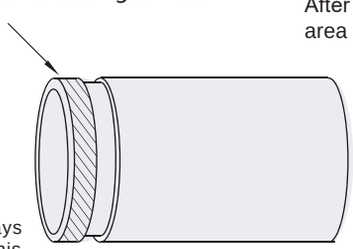
Spiral welded pipe

Spiral welded pipe may be used as long as the weld beads are removed from the gasket seating surface. It is also acceptable and recommended to weld a grooved end nipple to the pipe end as shown below. Whenever you remove weld beads or projections from the gasket seating surface, use caution so as to not over-grind the surface. After grinding, always apply a proper rust-prevention coating to this area

Check gasket seating surface

Galvanized pipe

Galvanized pipe is acceptableas long as the gasket seating surface is smooth and free from scale and imperfections that could affect gasket sealing. Whenever you remove welding beads or projections from the sealing surface of galvanized pipe, use caution so as to not over-grind the surface. After grinding, always apply a proper rust-prevention coating to this area.

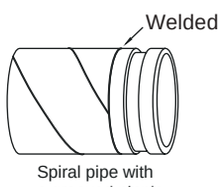


Galvanized Pipe

Spiral pipe

Weld Beads

ERW pipe is one of the most popular types of pipe used today. Depending on the individual pipe and manufacturer, welding beads may remain on the surface (inside and out) of the pipe. Always remove harmful weld beads near the pipe ends as they can cause rattling of the roll grooving machine resulting in inaccurate grooves.



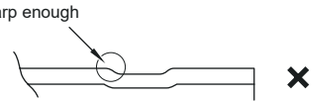
Spiral pipe with
a grooved nipple

Stainless steel pipe

Stainless steel pipe

Stainless steel pipe in general is more difficult to groove than carbon steel pipe, as it is more difficult to achieve defined groove corners on stainless pipe. Grooves that are not defined and have too much of a radius could result in joint failure. Care must be taken to process grooves as defined as possible. For this reason, roll-groove machine manufacturers offer a variety of roll sets depending on the pipe material and wall thickness being grooved. Always select the correct roll set for the pipe being grooved

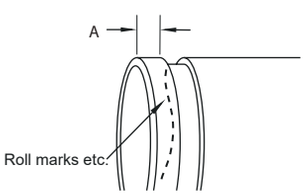
Corners are not sharp enough



Caution: If the same roll-set that has been used for carbon steel pipe is used on stainless steel pipe, rust or scale may be transferred to the stainless steel pipe during processing of the groove. Thus we recommend the use of a separate roll set specifically for use with stainless steel pipe. Also use caution to keep roll grooved stainless steel pipe dry prior to installation.

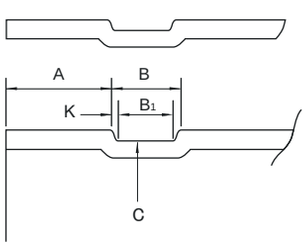
Gasket seating surface (A)

The exterior surface of the gasket seating area shall be free from any indentations, projections, roll marks or other harmful defects such as loose paint, scale, dirt, chips, grease and rust



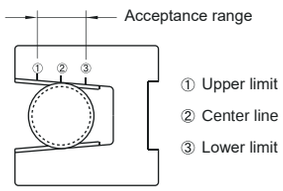
Roll groove profile

Roll grooves shouldes should be as d be as ef. To achieve optimum joint performance the “K” dimension should be as small as possible. When processing a roll groove the machine operator should manage the feed pressure of the upper roll set so as to achieve the best possible groove profile.

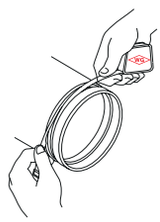


Groove diameter (C)

The groove diameters are average values. The groove must be of uniform depth around the entire pipe circumference. Use a VGS groove gage or groove measuring tape to check the groove diameter.

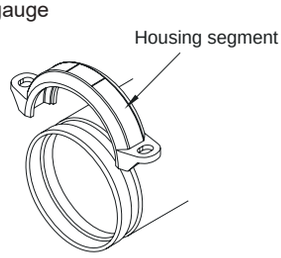


Groove diameter check



Use Wingrou Groove measuring tape

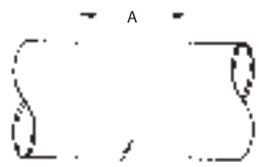
Or you can use a coupling housing for a quick check after verification of the groove dimensions. When using a housing segment as a reference always make up a sample and verify the diameter is within the acceptable range. If the housing fits well you may choose to use this as a reference gauge



Quick check with a housing segment

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



16mm(5/8")

the pipe. Always use the correct hole saw size as shown in this catalog 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" (16mm) 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 of dirt, scale or any imperfection that could affect proper seating or assembly of the fitting.

Hole Size: The hole sizes are dictated by the branch size of the mechanical tee.

Table 1 Hole Sizes for Mechanical Tees unit: mm/in

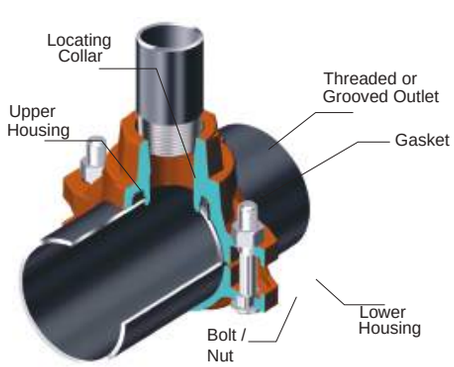
Models 3GS & 3JS Mechanical Tees			
Mechanical Tees Branch Size	Hole Dimensions		Surface Preparation "A"
	Hole Saw Size	Max Dia. Allowed	
15, 20, 25 1/2, 3/4, 1	38 1-1/2	41 1-5/8	89 3-1/2
32, 40 1-1/4, 1-1/2	51* 2	54* 2-1/8	102 4
50 2	64 2-1/2	67 2-5/8	114 4-1/2
65 2-1/2	70 2-3/4	73 2-7/8	121 4-3/4
80 3	89 3-1/2	92 3-5/8	140 5-1/2
100 4	114 4-1/2	118 4-5/8	165 6-1/2

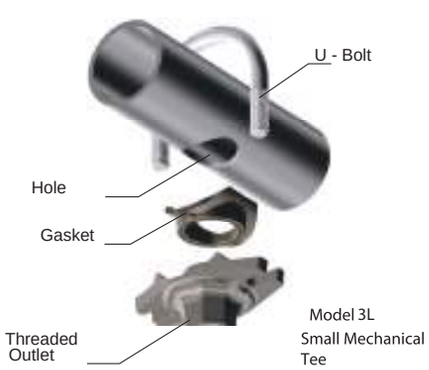
*See Table 1-b for exception.

Wingrou Hole Cutting Machine
Model No. TWK-IIIA
Ref.Page No.54

Table 2

Model 3L Saddle-Let			
Mechanical Tee Branch Size	Hole Dimensions		Surface Preparation "A"
	Hole Saw Size	Max Dia. Allowed	
15, 20, 25 1/2, 3/4, 1	30 1-3/16	32 1-1/4	89 3-1/2





Supports for risers

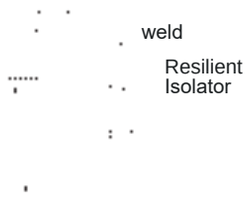
In multi-story buildings, risers shall be fixed (or anchored) at the lowest level and at the top of the riser and shall be supported by riser clamps or U-bolts at each floor level to prevent the risers from swaying. If risers are braced by the penetration floors, the number of riser clamps

or U-bolts may be reduced to one at each three stories. For risers, either flexible or rigid couplings can be used as long as proper anchoring and support is provided.

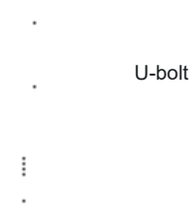
Riser clamp

- Anchors should be sufficient to hold the weight of water-filled pipe and pressure thrusts.
- Pipe guides (sway braces) should be such as to brace lateral movement of the system.

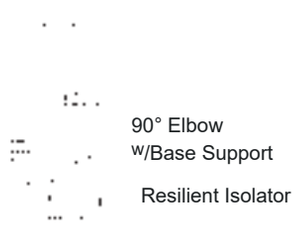
Anchors for risers (⊣⋈⊢)



Sway braces for risers (⊣⊢)

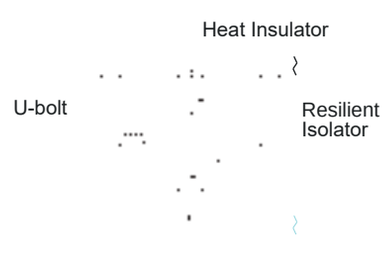


Anchor (⊣⋈⊢)



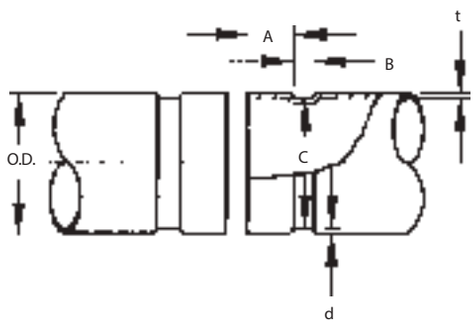
Sway brace (⊣⊢)

Sway brace (⊣⊢)



Wingrou is not reposible for the design of piping systems and accepts no liability for systems that are not properly designed.

Standard Roll Groove for ANSI B36.10 and Other IPS Pipe

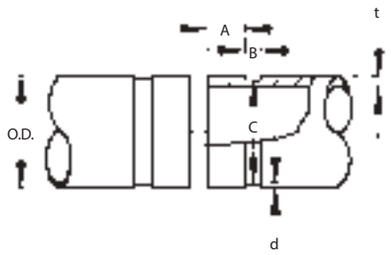


USE WINGROU STANDARD ROLL GROOVING MACHINE MODEL No. TWG II-AB
Ref. page No. 51

1	2			3	4	5	6	7	8
Nominal Size mm/in	Pipe O.D.			A ±0.76 ±0.030	B ±0.76 ±0.030	C +0.00 +0.000	Min. Wall t mm/in	Groove Depth d (ref.) mm/in	Max. Allowed Flare Dia. mm/in
	Basic mm/in	Tolerance							
20 0.75	26.7 1.050	+0.25 +0.010	-0.25 -0.010	15.88 0.625	7.14 0.281	23.83-0.38 0.938-0.015	1.65 0.065	1.42 0.056	29.2 1.15
25 1	33.4 1.315	+0.33 +0.013	-0.33 -0.013	15.88 0.625	7.14 0.281	30.23-0.38 1.190-0.015	1.65 0.065	1.60 0.063	36.3 1.43
32 1.25	42.2 1.660	+0.41 +0.016	-0.41 -0.016	15.88 0.625	7.14 0.281	38.99-0.38 1.535-0.015	1.65 0.065	1.60 0.063	45.0 1.77
40 1.5	48.3 1.900	+0.48 +0.019	-0.48 -0.019	15.88 0.625	7.14 0.281	45.09-0.38 1.775-0.015	1.65 0.065	1.60 0.063	51.1 2.01
50 2	60.3 2.375	+0.61 +0.024	-0.61 -0.024	15.88 0.625	8.74 0.344	57.15-0.38 2.250-0.015	1.65 0.065	1.60 0.063	63.0 2.48
65 2.5	73.0 2.875	+0.74 +0.029	-0.74 -0.029	15.88 0.625	8.74 0.344	69.09-0.46 2.720-0.018	2.11 0.083	1.98 0.078	75.7 2.98
80 3	88.9 3.500	+0.89 +0.035	-0.79 -0.31	15.88 0.625	8.74 0.344	84.94-0.46 3.344-0.018	2.11 0.083	1.98 0.078	91.4 3.60
90 3.5	101.6 4.000	+1.02 +0.040	-0.79 -0.031	15.88 0.625	8.74 0.344	97.38-0.51 38.34-0.020	2.11 0.083	2.11 0.083	104.1 4.10
100 4	114.3 4.500	+1.14 +0.045	-0.79 -0.031	15.88 0.625	8.74 0.344	110.08-0.51 4.334-0.020	2.11 0.083	2.11 0.083	116.8 4.60
125 5	141.3 5.563	+1.42 +0.056	-0.79 0.031	15.88 0.625	8.74 0.344	137.03-0.56 5.395-0.022	2.77 0.109	2.11 0.083	143.8 5.66
150 6	168.3 6.625	+1.60 +0.063	-0.79 0.031	15.88 0.625	8.74 0.344	163.96-0.56 6.455-0.022	2.77 0.109	2.16 0.085	170.9 6.73
200 8	219.1 8.625	+1.60 +0.063	-0.79 -0.031	19.05 0.750	11.91 0.469	214.40-0.64 8.441-0.025	2.77 0.109	2.34 0.092	223.5 8.80
250 10	273.0 10.750	+1.60 +0.063	-0.79 0.031	19.05 0.750	11.91 0.469	268.27-0.69 10.562-0.027	3.40 0.134	2.39 0.094	277.4 10.92

Pipe OD (Column 2):
Maximum allowable tolerances from square cut ends is 0.03" for sizes up to 3 1/2"; 0.045" for 4" thru 6"; and 0.060" for sizes 8" and above. Gasket Seating Surface (Column 3):
The gasket seating surface shall be free from deep scores, marks, or ridges that could prevent a positive seal.
Groove Width (Column 4):
Groove width is to be measured between vertical flanks of the groove side walls.
Groove Diameter (Column 5):
The 'C' diameters are average values. The groove must be of uniform depth around the entire pipe circumference.
Minimum Wall Thickness (Column 6):
The 't' is the minimum allowable wall thickness that may be roll-grooved.
Groove Depth (Column 7):
The 'd' is for reference use only. The groove dimension shall be determined by the groove diameter 'C'.
Flare Diameter (Column 8):
The pipe end that may flare when the groove is rolled shall be within this limit when measured at the extreme end of the pipe.

Standard Cut Groove Specifications for IPS / BS / ISO / JIS Pipe



1	2			3	4	5	6	7
Nominal Size mm/in	Pipe O.D.			A ±0.79 ±0.031	B ±0.79 ±0.031	C +0.00 +0.000	Min. Wall t mm/in	Groove Depth d (ref.) mm/in
	Basic mm/in	Tolerance						
20	26.7	+0.25	-0.25	15.88	7.95	23.83-0.38	2.87	1.42
0.75	1.050	+0.010	-0.010	0.625	0.313	0.938-0.015	0.113	0.056
25	33.4	+0.33	-0.33	15.88	7.95	30.23-0.38	3.38	1.60
1	1.315	+0.013	-0.013	0.625	0.313	1.190-0.015	0.133	0.063
32	42.2	+0.41	-0.41	15.88	7.95	38.99-0.38	3.56	1.60
1.25	1.660	+0.016	-0.016	0.625	0.313	1.535-0.015	0.140	0.063
40	48.3	+0.48	-0.48	15.88	7.95	45.09-0.38	3.68	1.60
1.5	1.900	+0.019	-0.019	0.625	0.313	1.775-0.015	0.145	0.063
50	60.3	+0.61	-0.61	15.88	7.95	57.15-0.38	3.91	1.60
2	2.375	+0.024	-0.024	0.625	0.313	2.250-0.015	0.154	0.063
65	73.0	+0.74	-0.74	15.88	7.95	69.09-0.46	4.78	1.98
2.5	2.875	+0.029	-0.029	0.625	0.313	2.720-0.018	0.188	0.078
65	76.1	+0.76	-0.76	15.88	7.95	72.26-0.46	4.78	1.93
---	---	---	---	---	---	---	---	---
80	88.9	+0.89	-0.79	15.88	7.95	84.94-0.46	4.78	1.98
3	3.500	+0.035	-0.031	0.625	0.313	3.344-0.018	0.188	0.078
90	101.6	+1.02	-0.79	15.88	7.95	97.38-0.51	4.78	1.98
3.5	4.000	+0.040	-0.031	0.625	0.313	3.834-0.020	0.188	0.078
100	114.3	+1.14	-0.79	15.88	9.53	110.08-0.51	5.16	2.11
4	4.500	+0.045	-0.031	0.625	0.375	4.334-0.020	0.203	0.083
125	141.3	+1.42	-0.79	15.88	9.53	137.03-0.56	5.16	2.11
5	5.563	-0.056	-0.031	0.625	0.375	5.395-0.022	0.203	0.083
150	165.1	+1.60	-0.79	15.88	9.53	160.80-0.56	5.56	2.16
---	---	---	---	---	---	---	---	---
150	168.3	+1.60	-0.79	15.88	9.53	163.96-0.56	5.56	2.16
6	6.625	+0.063	-0.031	0.625	0.375	6.455-0.022	0.219	0.085
200	219.1	+1.60	-0.79	19.05	11.13	214.40-0.64	6.05	2.34
8	8.625	+0.063	-0.031	0.750	0.438	8.441-0.025	0.238	0.092
250	273.0	+1.60	-0.79	19.05	12.70	268.27-0.69	6.35	2.39
10	10.750	+0.063	-0.031	0.750	0.500	10.562-0.027	0.250	0.094

Gasket Seating Surface (Column 3): The gasket seating surface shall be free from deep scores, marks, or ridges that could prevent a positive seal. Groove Width (Column 4): Groove width is to be measured between vertical flanks of the groove side walls. Groove Diameter (Column 5): The 'C' diameters are average values. The groove must be of uniform depth around the entire pipe circumference. Minimum Wall Thickness (Column 6): The 't' is the minimum allowable wall thickness that may be cut-grooved. Groove Depth (Column 7): The 'd' is for reference use only. The groove dimension shall be determined by the groove diameter 'C'.

When it is necessary to perform a deviation, the hole produced should comply with the tolerence specified below and be correctly situated on the central line of the tube. In the section of length L and in an area of 16mm around the hole, the surface must be perfectlyclean and smooth so that the gasket is perfectly seated. Never flame drill

Wingrou Hole Cutting Machine
Model No. TWK-IIIA

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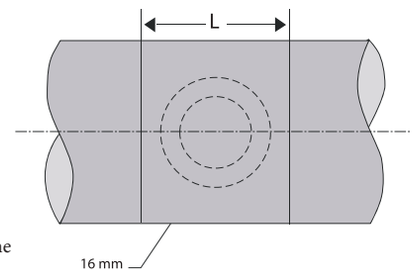


3L (Branch for sprinkler)

Main tube	Required branch	Hole to execute		Length L (mm)
		Nominal diameter (mm - Inches)	Maximum diameter (mm - Inches)	
DN32 (1 1/4") (Φ ext = 42,4 mm)	DN15 (1/2" - 21,3 mm)	30.5 - 1.20	31.6 - 1.24	89
	DN.20 (3/4" - 26,9 MM)	30.5 - 1.20	31.6 - 1.24	89
	DN25 (1" - 33,4 mm)	30.5 - 1.20	31.6 - 1.24	89
DN40 (1 1/2") (Φ ext = 48,3 mm)	DN15 (1/2" - 21,3 mm)	30.5 - 1.20	31.6 - 1.24	89
	DN20 (3/4" - 26,9 MM)	30.5 - 1.20	31.6 - 1.24	89
	DN25 (1" - 33,4 mm)	30.5 - 1.20	31.6 - 1.24	89
DN50 (2") (Φ ext = 60,3 mm)	DN15 (1/2" - 21,3 mm)	30.5 - 1.20	31.6 - 1.24	89
	DN20 (3/4" - 26,9 MM)	30.5 - 1.20	31.6 - 1.24	89
	DN25 (1" - 33,4 mm)	30.5 - 1.20	31.6 - 1.24	89
DN65 (2 1/2") (Φ ext = 76,1 mm)	DN15 (1/2" - 21,3 mm)	30.5 - 1.20	31.6 - 1.24	89
	DN20 (3/4" - 26,9 MM)	30.5 - 1.20	31.6 - 1.24	89
	DN25 (1" - 33,4 mm)	30.5 - 1.20	31.6 - 1.24	89

3J and 3G (Mechanical tee threaded and grooved)

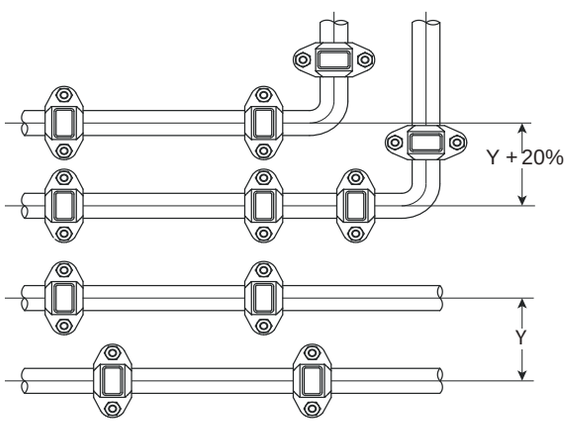
Main tube	Required branch	Hole to execute		Length L (mm)
		Nominal diameter (mm - Inches)	Maximum diameter (mm - Inches)	
DN50 (2") (Φ ext = 60,3 mm)	DN15 (1/2" - 21,3 mm)	38.0 -1.50	39.6-1.16	89
	DN.20 (3/4" - 26,9 MM)	38.0 -1.50	39.6 -1.l6	89
	DN25 (1" - 33,4 mm)	38.0 -1.50	39.6 -1.l6	89
	DN32 (11/4" - 42,4 mm)	44.5 -1.75	46.6 -1.83	102
	DN40 (11/2" - 48,3 MM)	44.5 -1.75	46.6 -1.83	102
DN65 (2 1/2") (Φ ext = 76,1 mm)	DN15 (1/2" - 21,3 mm)	38.0 -1.50	39.6 -1.l6	89
	DN20 (3/4" - 26,9 MM)	38.0 -1.50	39.6 -1.l6	89
	DN25 (1" - 33,4 mm)	38.0 -1.50	39.6 -1.l6	89
	DN32 (11/4" - 42,4 mm)	51.0 -2.00	52.6 -2.07	102
	DN40 (11/2" - 48,3 MM)	51.0 -2.00	52.6 -2.07	102
DN80 (3") (Φ ext = 88,9 mm)	DN15 (1/2" - 21,3 mm)	38.0 -1.50	39.6 -1.l6	89
	DN20 (3/4" - 26,9 MM)	38.0 -1.50	39.6 -1.l6	89
	DN25 (1" - 33,4 mm)	38.0 -1.50	39.6 -1.l6	89
	DN32 (11/4" - 42,4 mm)	51.0 -2.00	52.6 -2.07	102
	DN40 (11/2" - 48,3 MM)	51.0 -2.00	52.6 -2.07	102
	DN50 (2" - 60,3 mm)	64.0 -2.50	6l.6 -2.l8	114
DN100 (4") (Φ ext = 114,3 mm)	DN15 (1/2" - 21,3 mm)	38.0 -1.50	39.6 -1.l6	89
	DN20 (3/4" - 26,9 MM)	38.0 -1.50	39.6 -1.l6	89
	DN25 (1" - 33,4 mm)	38.0 -1.50	39.6 -1.l6	89
	DN32 (11/4" - 42,4 mm)	51.0 -2.00	52.6 -2.07	102
	DN40 (11/2" - 48,3 MM)	51.0 -2.00	52.6 -2.07	102
	DN50 (2" - 60,3 mm)	64.0 -2.50	6l.6 -2.l8	114
	DN65 (21/2" - 76,1mm)	70.0 -2.75	71.6 -2.82	120
	DN80 (3" - 88,9 MM)	89.0 -3.50	90.6 -3.l7	140
DN125 (5") (Φ ext = 139,7 mm)	DN32 (11/4" - 42,4 mm)	51.0 -2.00	52.6 -2.07	102
	DN40 (11/2" - 48,3 MM)	51.0 -2.00	52.6 -2.07	102
	DN50 (2" - 60,3 mm)	64.0 -2.50	6l.6 -2.l8	114
	DN65 (21/2" - 76,1mm)	70.0 -2.75	71.6 -2.82	120
DN150 (61/2" OD) (Φ ext = 165,1 mm)	DN50 (2" - 60,3 mm)	64.0 -2.50	6l.6 -2.l8	114
	DN65 (21/2" - 76,1mm)	70.0 -2.75	71.6 -2.82	120
DN150 (6") (Φ ext = 168,3 mm)	DN32 (11/4" - 42,4 mm)	51.0 -2.00	52.6 -2.07	102
	DN40 (11/2" - 48,3 MM)	51.0 -2.00	52.6 -2.07	102
	DN50 (2" - 60,3 mm)	64.0 -2.50	6l.6 -2.l8	114
	DN65 (21/2" - 76,1mm)	70.0 -2.75	71.6 -2.82	120
	DN80 (3" - 88,9 MM)	89.0 -3.50	90.6 -3.l7	140
	DN100 (4" - 114,3 mm)	114.0 -4.50	115.6 -4.55	165
DN200 (8") (Φ ext = 219,1 mm)	DN50 (2" - 60,3 mm)	64.0 -2.50	6l.6 -2.l8	114

SPACING REQUIREMENTS FOR GROOVED PIPING SYSTEMS

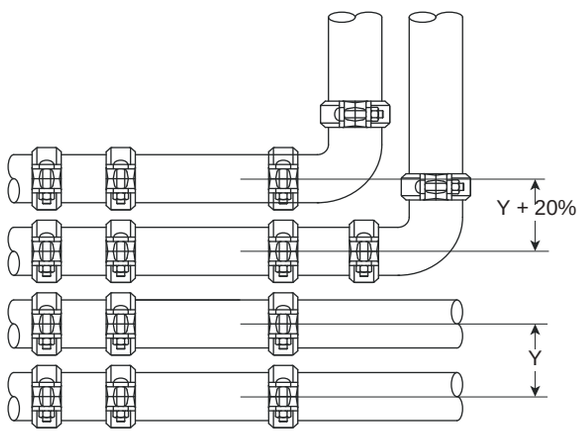
Since the grooved piping method incorporates externally mounted housings, consideration must be given to external dimensions beyond the pipe OD.

NOTE : Allowance for insulation, when necessary, is not included in the following examples.

Recommended Minimum pipe Spacing



Example with Bolt Pads Facing Out

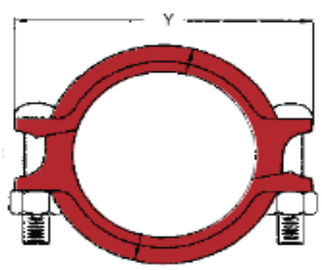


Example with Bolt Pads Facing Out

Illustrations are exaggerated for clarity

To allow for easy installation, insulation, and maintenance, consideration must be given to proper spacing between pipelines. Since Wingrou grooved pipe couplings are externally mounted housings that contain bolt pads, allow enough access space to tighten the bolts. In addition, provide enough space to prevent interference between piping and adjacent couplings.

The pipe centerline must be spaced with the width of the coupling housings (“Y” dimension) for systems where couplings are staggered. Add an additional 20% to the width (Y) when couplings are inline, as shown above.



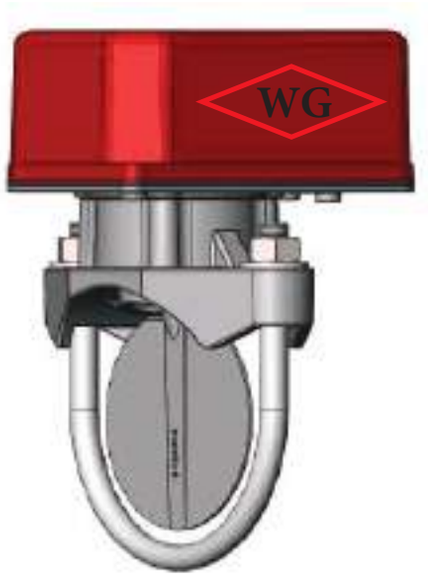
NOTE : The “Y” dimension is the maximum dimension across the coupling. Bolt pads can be positioned in any orientation to provide adequate clearance if the orientation shown causes interference with other system components.

External Clearance Allowance

When installing grooved piping systems in confined areas, such as a pipe shaft, a tunnel, a narrow trench, or when joining riser pipe and dropping it through riser holes, consideration must be given to the external clearance of the housings. This clearance must be slightly greater than the “Y” dimension of the widest point. The necessary clearance will vary depending upon installation procedures, the proximity of other pipes, and other factors.

Engineering SPecifications

The Wingrou water flow indicators shall be installed on system piping as designated on the drawing and/or as specified herein. Water flow indicators shall mount on any clear pipe span of the appropriate normal size, either a horizontal or vertical pipe. The indicators shall have a sensitivity in the range of 4-10 gallons per minute and a static pressure rating up to 450psi for 2”-8” (50mm thru 200mm) pipes. The indicator shall respond to water flow in the specified direction after a preset time delay that is field adjustable. The retard structure shall be a sealed mechanical pneumatic unit with visual time delay adjustment.

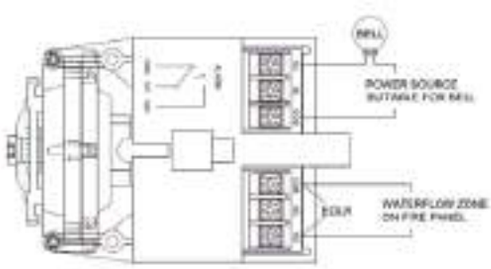


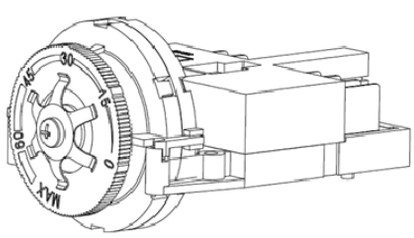
Note: Cover material is Aluminum, alternative Plastic Cover.

Features and Specifications

Working Pressure	Max3.1Mpa (450psi)		
S e n s i t i v i t y	15.0-37.5L/min (4-10GPM)	**Maximum Surge**	5.5m/s (18FPS)
Contact Rating	Two sets of SPDT 10.1A@125/250VAC 2 A @ 2 4 V D C	**Micro-switch**	100% synchronization
Enclosure Rating	NEMA 4- suitable for indoor/outdoor	**Tamper Device**	Special tamper screws to prevent disassembly
Compatible Pipe	Steel pipe, schedule 10 through 40	**S t a n d a r d s**	GB5135.7-2018 & FM1042-2016&UL346

Typical Electrical Connections and Time Delay Adjustment





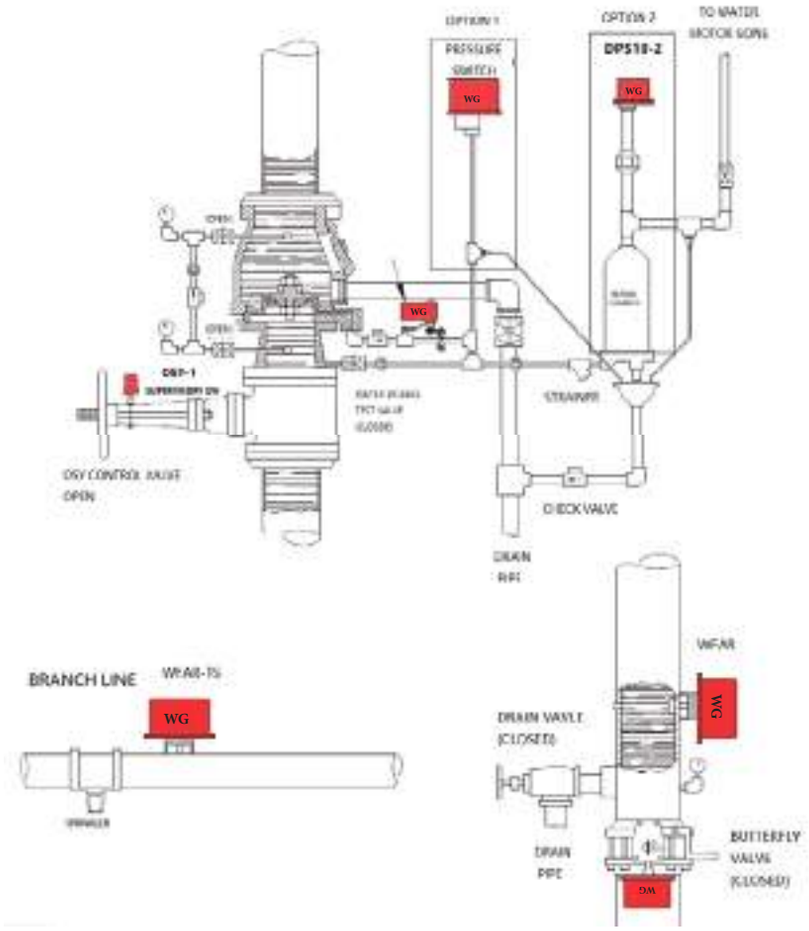
Retard Structure can be set from “0” to “MAX” position, delay time can be set from 0~90secs

Figure Figure and Size

Model	Description	Pipe Size	Hole Size
RF-2	Vane-Type Water flow indicator	50mm (2”)	31.8mm(1-1/4”)
RF-2.5	Vane-Type Water flow indicator	65mm (2.5”)	31.8mm(1-1/4”)
RF-3	Vane-Type Water flow indicator	80mm (3”)	50.8mm(2”)
RF-4	Vane-Type Water flow indicator	100mm (4”)	50.8mm(2”)
RF-6	Vane-Type Water flow indicator	150mm (6”)	50.8mm(2”)
RF-8	Vane-Type Water flow indicator	200mm (8”)	50.8mm(2”)

(Φ ext = 219,1 mm)

Wingrou Water Flow Switch



Wingrou series water flow indicators are an vane-type & saddle water indicator with time delay function, which can suit for pipe schedules 10 through 40, size 2" through 8"(50mm to 200mm). The external structure is easy to install and maintain. Paddles are made from a novel polymer engineering material, which enhances the sensitivity and stability of the water flow indicator. The delay structure is convenient for field adjustment or replacement.

DPS10/40 series pressure switches design structure is reliable, performance is stable, the action pressure factory setting is:5~7psi(0.035~0.05MPa), when install on the wet alarm valve, there is no false signal.

Engineering Specifications

The OSY-1 supervisory switch is used to monitor the open position of an OS&Y (outside screw and yoke) type gate valve. OSY-1 supervisory switch shall be installed on each valve as designated on the drawing and/or as specified herein, Switches shall be mounted so as not to interfere with the normal operation of the valve and shall be adjusted to operate with two revolutions of the valve control or when the stem has moved no more than one-fifth of the distance from its normal

position.

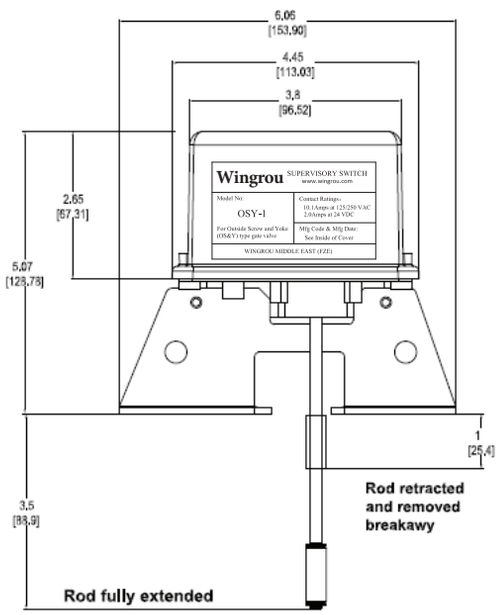
Note: Cover material is Alumi num, alternative Plastic Cover.

Wingrou OSY-01

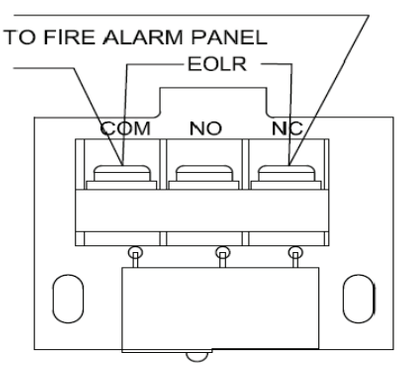
Technical Specifications

Enclosure Rating	NEMA 4- suitable for indoor/outdoor	**Operating Temperature:** 32º F to 140ºF (0ºC to 60ºC)	
Conduit Entrances: One opening for 1/2" conduit		**Tamper Device :** Special tamper screws to prevent disassembly	
Contact (OSY-1) : one set of SPDT (Form C)		**Contact Rating**	10.1A@125/250VA C 2 A @ 2 4 V D C
Standards:	UL346& FM3132	**Warranty:**	1 Years

Dimensions(mm)



Field Typical Electrical Connections



Model and Size Wingrou OSY-01

Model	Description	Contact
OSY-1	Supervisory Switch for OSY Gate Valve	one set of SPDT

WINGROOVER 2 - 12 ''
Advance electro-hydraulic rolling groover for steel pipes Ø 2-12 (60-325 mm) for rolling of grooves on thin-walled and standard steel pipes

Product Pro ile

Sprinkler systems, installations, larger heading units, industrial use and mining

- Designed for field roll grooving of 8-24 (219-630 mm) pipe
- Sturdy hydraulic-pump with precisely formed grips for ideal handling
- Compact and very stable machine design
- Powerful yet quiet motor
- Fine adjustment for groove depth and regulation

Working range Pipe	:	2 - 12'' (60-325 mm)
wall-thickness Weight	:	10 mm
Dimensions Current	:	163 kg
Frequency Speed	:	78x70x92(cm)
	:	Single phase Hz(110/120/220/230/240V : 50/60HZ
	: 23 rpm	

Fig. Diameter measuring tape

Scope of delivery: WINGROOVER machine 2 - 12'', roll groove set 2-1/2roll groove set 3-6'', roll groove set 8-12'', pipe support stand, tools for installation, diameter measuring tape, installation and instructional CD

Model	kg	
WINGROOVER 2-12'' Roll	128.0	1
Groove set 2 - 21/2'' Roll	1.5	1
Groove set 3 - 6'' Roll	2.2	1
Groove set 8 - 12''	2.4	1

Model	kg	
Top Roll Groove set 2 - 6'' Top	1.5	1
Roll Groove set 8 -12 Pipe	2.2	1
Support Stand Diameter	29	1
measuring tape	0.05	1

WINGROOVER 8 - 24 ''

Advance electro-hydraulic rolling groover for steel pipes Ø 8-24 (219-630 mm) for rolling of grooves on thin-walled and standard steel pipes

Pipe Preparation Tools
Field Fabrication

Product Profile

Sprinkler systems, installations, larger heading units, industrial use and mining

weDesigned for field roll grooving of 8-24 (219-630 mm) pipe
- Sturdy hydraulic-pump with precisely formed grips fori deal handling

- Compact and very stable machine design
- Powerful yet quiet motor
- Fine adjustment for groove depth and regulation

Working Range : 8 - 24" (219-630 mm)
Pipe Wall-thickness : 13 mm
Weight : 340 kg
Dimensions : 102x75x47 (cm)
Current Frequency : Three phase Hz(220/380/415/440V : 50/60HZ
Speed : 50 rpm

Scope of delivery: WINGROOVER machine 8-24 roll groove set 8-14 roll groove set 16-18'', roll groove set 20-24'', pipe support stand, tools for installation, diameter measuring tape, installation and instructional CD

Model	kg	
WINGROOVER 8-24"	300	1
Roll Groove set 8-14"	9	1
Roll Groove set 16-18"	8.675	1
Roll Groove set 20-24"	8.515	1

Model	kg	
Top Roll Groove set 8-22"	1.27	1
Top Roll Groove set 24	1.32	1
Pipe Support Stand	55	1

PIPE MACHINERY TWQ-IIIA PIPE CUTTING MACHINE

Pipe Preparation Tools
Field Fabrication

Product Features

- The Construction Allows Quick Change of Pipe Diameters
- Machine Can Adjust From DN50 to DN300 Pipe in Seconds
- Alloy Steel Blade Allows Hundreds of Cuts Between Sharpening
- Pipe Can be Moved Directly From the Pipe Cutter to the Roll Groove Machine Without Any Further End Preparation
- For Onsite or Workshop Use
- Easy Move Wheel-Handle
- Built in Wheel and Handle For Easy Transport

Technical Data

- Code: WG-TWQ-IIIA
- Pipe Diameter: DN50-DN300
- Max Wall Thickness: Heavy Wall Pipe 10mm
- Output RPM: 23 rpm
- Motor: Single Phase Induction Motor-
- Power: 240V 1100 W
- Frequency: 50-60 Hz
- Net Weight: 108 kg
- Dimension: 720 x 660 x 970mm

WINGROU TWK-111A HOLE CUTTING MACHINE

Pipe Preparation Tools
Field Fabrication

Product Description

FEATURES

• This machine is designed for drilling holes up to 114mmon a steel pipe.

• It is equipped with a high-performance low-noise gear reduction motor to offer high torque.

Model # TWK-111A

Technical Data

• Code:	H-TWK-111A
• Capacity:	DN25 –DN100 Holes
• Max. Hole Diameter:	114mm
• Max. Wall Thickness:	
• Output RPM:	38 RPM
• Gross Weight:	26kg
• Packaging Size:	320x320x640 mm

General
These terms and conditions shall control with respect to any purchase order or sale of seller's products. No waiver, alteration or modification of these terms and conditions wheather on buyer's purchase order or otherwise shall be valid unless the waiver, alteration or modification is specfically accepted in writing and signed by authorized representative of seller

Delivery
Seller will make every effort to complete delivery of products as indicated on seller's acceptance of an order, but seller assumes no responsibility or liability, and will accept no back charge, for loss or damage due to delay or inability to deliver caused by acts of God, war labor difficulties, accident, delays,or carriers, by contractors or suppliers, inability to obtain materials, shortages of fuel and energy, or any other causes of any kind whatsoever beyond the control of seller. Seller may terminate any contract of sale of its products without liability of any nature, by written notice to buyer, in the event that the delay in the delivery or performance resulting from any of the aforesaid cause shall continue for a period of sixty(60)days. Under no circumstance shall seller be liable for any special or consequential damage or for loss, damage, or expence (whether or not based on negligence) directly or indirectly arising from delays or failure to give notice of delay.

Warranty
We warrant all products to be free from defects in materials and workmanship under normal conditions of use and service. Our obligation under this warranty is limited to repairing or replacing at our option at factory any products which shall within one year after delivery to original buyers, be returned with transportation charges prepaid, and which our examination shall show to our satisfaction to have been defective.

THIS WARRANT IS MADE EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITTNESS FOR A PARTICULAR PURPOSE. THE BUYER'S SOLE AND EXCLUSIVE REMEDY SHALL BE FOR THE REPAIR OR REPLACEMENT OF DEFECTIVE PRODUCTS AS PROVIDED HEREIN. THE BUYER AGREES THAT NO OTHER REMEDY (INCLUDING, BUT NOT LIMITED TO, INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR LOST PROFITS, LOST SALES,INJURY TO PERSON OR PROPERTY OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL LOSS) SHALL BE AVAILABLE TO HIM.

Seller neither assumes nor authorizes any person to assume for it any other liability in connection with the sales of such products. This warranty shall not apply to any product which has been subject to missuse. negligence or accident, which has been repaired or altered in any manner outside of the factory or which has been used in a manner contrary to seller instructions or recommendations. seller shall not be responsible for delivery error and design error due to inaccurate or incomplete information supplied by Buyer or its representatives.

Liability
Seller will not be liable for any loss.damage,cost of repairs,inciental or consequential damage of any kind, whether based upon warranty(except for the obligation accepted by seller under "warranty" above), contract or negligence arising in connection with the design, manufacture, sale, use or repair of the products or of the engineering designs supplied to buyer.

Returns
Seller cannot accept return of any products unless its written permission has been first obtained, in which case same be credited subject to the following (a) All materials returned must, on its arrival at seller's plant, be found to be in first-class condition; if not, cost of putting in saleable condition will be deducted from credit memoranda;(b) A handling charge deduction of twenty five(25%) will be made from aal shipments.

Shipments
All products sent out will be carefully examined, counted and packed. The cost any special packing or special handling caused by Buyer's requirements or request shall be added to the amount of the order. No claim for shortages will be allowed unless made in writting within ten(10) days of receipt of shipment. Claim for products damaged or lost in transit should be made on the carrier, seller's reponsibility ceases, and title asses on delivery to the carrier.

INSTALLATION INSTRUCTIONS

MECHANICAL GROOVED COUPLINGS STYLE No. 1GS,1N,1NH

1. Remove one nut and bolt from housing loosen the other nu until it is flush with the end of the bolt. Remove the gasket from the housing.

2. Check suitability of gasket for intended service and apply a thin coat of silicone or other compatible pipe lubricant to gasket lips and outside of the gasket, if the gasket surface does not have lubricity

3. Insert ans push the gasket over one of the grooved ends of the two pipes to be loined. Gasket lip should not overhang pipe end.

4. Align and bring the pipes end together and side gasket into position entered between the grooves on each pipe. Gasket should should not extend into groove on either pipe.

5. Place housings over gasket and apply pressure by hands to engage the keys into the grooves. Insert bolt and apply nuts finger tight. Make sure on Style 1GS the tonge and groove match to avoid product failure.
6. Tighten nuts alternately and equally until housing bolts pads are firmly together metal-to-metal. Uneven tightening will pinch the gasket.
On style 1GS there may be slight gap at bolt pads.

WARNING: DO NOT MAKE ADJUSTMENT TO GROOVED PRODUCTS WHILE THE PIPING SYSTEM IS UNDER PRESSURE.

REDUCING FLEXIBLE COUPLING STYLE No. 1NR

1. Remove nutS and bolt from housing. Remove the gasket from the housing.

2. Check suitability of gasket for intended service and apply a thin coat of silicone or other compatible pipe lubricant to gasket lips and outside of the gasket, if the gasket surface does not have lubricity.

3. Insert the large opening of the gasket over the large pipe ends until the steel washer touches the pipe ends

4. Align the centerline and insert the smaller pipe end into the gasket. A slight twisting motion of the pipe eases assembly. Stell washer will prevent the movement of smaller pipe inside the large pipe.

5. position the housing halves over the gasket, making sure the housing keys engage the grooves on each pipe. Proper lubrication of the interor of the housing and exterior of the gasket is important to prevent gasket pinching.

6. insert the bolt and start the nuts manually. Tighten the nuts uniformly alternating side until housing bolts pads meet firmly metal-to-metal. Uneven the tightening will pinch the gasket

MECHANICAL BRANCH OUTLET STYLE No. 3G, 3J, 3L

1.. Cut or drill in pipe Hole diameter for each mechanical branch out-let is listed on the chart pertaining to the product Hole must be drilled on the center-line of the pipe. Remove the cut piece and cutting chips. make sure that the pipe surface within 7/8 " of the hole is clean, smooth and free of indentations or projections which would afect proper sealing.

2. Remove one nut and bolt from housing loosen the other nut until it is flush with the end of the bolt. Remove the tape and lift gasket.

3. Check suitability of gasket for intended service . Reposition the gasket into the housing using alignment tabs on the sides for proper positioning.

4. Rotate the lower housing approximately 90 Degree away from the upper or outlet section. Place the upper onto the surface of the pipe in line with the outlet hole prepared per instructions and rotate the lower section around the pipe and close the two halve.

5. insert bolt in its hole and finger tighten both nuts, making sure that the locating collar is in the outlet hole. Also make sure that the positioning lugs aligned properly.

6 tighten nuts uniformly until the gasket pocket area of the upper housing is in the complete contact with pipe surface and the assembly is rigid.Nuts must be tightened with even gaps between bolt pads. Torgue in excess of what is recommended is not desirable.

SPLIT FLANGE ADAPTER STYLE No. 321

1. Open the flange Adapter and place hinged flange around the grooved pipe end with the circular key section locating into the groove.

2. Insert a standard bolt through the mating holes of the flange to secure the flange in the groove.

3. Check suitability of gasket for intended service and apply a thin coat of silicone or other compatible pipe lubricant to gasket lips and outside of the gasket, if the gasket surface does not have lubricity

4. Press the gasket into cavity between the pipe OD, and flange recess.
5. Insert a standard flange bolt in the hing hole opposite the lock bolt and direct the two bolt assembly to mate with the flangeof the device to be joined.

6. Add ghe remaining standard flange bolt and tighten all nuts evenly until faces contact firmly or bolt attain recommended joint torque values.

WARNING: DO NOT MAKE ADJUSTMENT TO GROOVED PRODUCTS WHILE THE PIPING SYSTEM IS UNDER PRESSURE.

Depressurize and drain the piping system before attempting to install, remove, or adjust any piping products. Wear safety glasses, hardhat, and foot protection.

Wingrou is not reposible for the design of piping systems and accepts no liability for systems that are not properly designed.

Notes

Notes

For more info, please contact us at:

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info@wingrou.com