

GROOVED PIPING PRODUCTS



FIRE PROTECTION PIPING SOLUTIONS

General Information

General Note.....	01
Rigid and Flexible coupling.....	02
Design features.....	03
Rubber gasket.....	04
Data chart note.....	06

Grooved Couplings

Figure 1GS Rigid Coupling.....	09
Figure 1N Flexible Coupling.....	10
Figure 1X Angle Pad Coupling.....	11
Figure 1NH Heavy Duty Flexible Coupling.....	12
Figure 1NR Reducing Flexible Coupling.....	13

Hole Cut Piping System (Mechanical Tee)

Figure 3G/3J (Grooved & Threaded).....	16
Figure 3G/3J (Grooved & Threaded).....	17
Figure 3G/3J (Grooved & Threaded).....	18
Figure 3L Saddle-Let U Bolt Type.....	19

Flange Adapter

Figure 321 Grooved Split Flange.....	21
Figure 321A Grooved Adapter.....	22
Figure 321A Universal Grooved Adapter.....	23

Grooved Fittings

Figure 90 STD 90° Elbow.....	25
Figure 130 STD Equal Tee.....	25
Figure 180 STD Cross Tee.....	25
Figure 90S S/R 90° Elbow.....	26
Figure 130S S/R Equal Tee.....	26
Figure 180S S/R Cross Tee.....	26
Figure 120 45° Elbow.....	27
Figure 130 22.5° Elbow.....	27
Figure 180 11.25° Elbow.....	28
Figure 131 /131N Red.Tee(Grooved & Threaded)	29
Figure 131/131N Red.Tee(Grooved & Threaded)	30
Figure 240/240N Con. Reducer(Gvd & Thrd)--	31
Figure 240/240N Con.Reducer(Gvd & Thrd)----	32
Figure 230/230N Ecc.Reducer(Gvd & Thrd)----	33
Figure 230/230N Ecc.Reducer(Gvd & Thrd)----	34
Figure 300 End Cap.....	35
Adapter Nipple.....	36
Figure 1N/1NH Expansion Joint.....	37

Pipe Preparation

Metric Heavy Nut & Bolt.....	38
Pipe End Preparation	39
Pipe end preparation.....	43
Hole Cutting preparation.....	44
Design Application.....	45
Useful information.....	46
Piercing the tube.....	48
Space requirement for grooved piping.....	49
Water flow switch.....	50
Supervisory switch.....	52
Roll Grooving Machine TWG-II-AB.....	53
Roll Grooving Machine TWG-IVA.....	54
Pipe cutting machine TWQ-III-A.....	55
Hole Cutting Machine TWK-III-A.....	56
Hole Cutting Machine TWK-VA.....	57
Threading Machine TWT-IT50B.....	58
Limited Warranty.....	59
Installation instruction.....	60

Fire Protection Valves

Swing Check Valve	72
Y Strainer Valve.....	74
Deluge Valve.....	75
Alarm Check Valve	76
Pressure Reducing Valve.....	77

Refer to our Grooved Piping Products Handbook for detailed installation instructions

General Notes

The development of ductile iron began in the United States and the United Kingdom in the late 1940s. Its superior strength is primarily due to the crystallization of graphite in the form of nodules. This innovation resulted in ductile iron with tensile and yield strength properties comparable to, or even exceeding, some steel castings. The combination of enhanced strength and excellent castability allowed for reductions in the weight and cost of many components. As a result, a wide range of components that were previously made from gray iron, malleable iron, and steel castings has been transitioned to ductile iron over the years.

Ductile iron is an excellent material for grooved mechanical components, providing strength comparable to or greater than that of wrought or cast steel piping materials. Most Wingrou components are manufactured from ductile iron that meets the specifications of ASTM A536 Grade 65-45-12 and/or ASTM A395 Grade 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.

- 1 Always read and thoroughly understand all installation instructions for Wingrou products before beginning installation. To prevent serious personal injury, ensure you wear safety glasses, a hard hat, and appropriate foot protection.
- 2 Always depressurize and drain the piping system before attempting to disassemble, adjust, or remove any piping components.
- 3 Designers must be knowledgeable about and understand all relevant building and piping standards, codes, and specifications. It is the designer's responsibility to select and 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 any previously published data. Wingrou reserves the right to change product designs and specifications without notice or obligation. For the latest information, please refer to the Wingrou website.

Typical Applications

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

Grooved Pipe Joining Technology

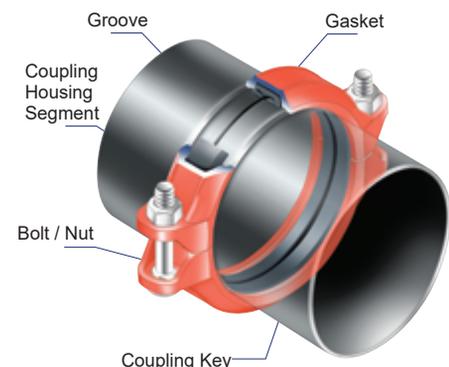
How does it work?

The groove is cold-formed or machined into the pipe end using a grooving tool. The coupling housings, which fully surround a gasket, are then assembled around the two grooved pipe ends, with the key sections of the housings engaging into the grooves. The bolts and nuts are tightened using 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.



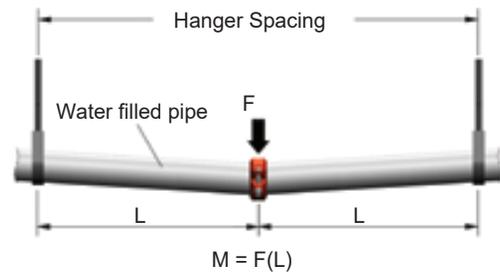
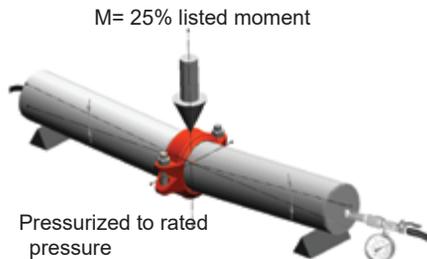
Rigid & Flexible Couplings

Grooved mechanical couplings are available in both rigid and flexible models. A rigid coupling is used in applications where a solid, inflexible joint is desired, akin to traditional flanged, welded, or threaded connections. To qualify as rigid, a coupling should allow less than one degree of deflection or angular movement.

Definition : Grooved couplings are subjected to internal pressures and external bending forces during service. According to ASTM F1476-07, a rigid coupling is defined as a joint that allows essentially no angular or axial movement of the pipes. In contrast, a flexible coupling is defined as a joint that permits limited angular and axial movement of the pipes.

Rigidity Proof Test : Rigidity proof testing involves applying 25% of the listed moment to the test assembly while it 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 at least one degree of angular movement. They are typically used in applications with curved or deflected layouts, systems exposed to external forces (such as seismic events), and situations where vibration and noise attenuation are important.

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

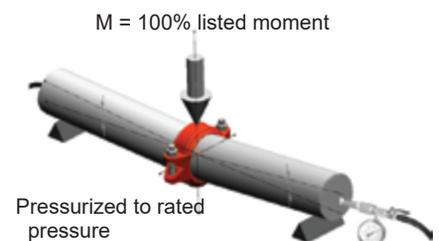
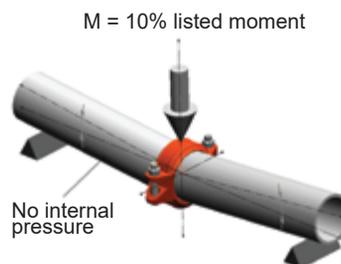
The rigid coupling shall pass the test if the angle does not change by more than angle θ. θ is calculated as follows:

$$\theta^\circ = 60 \text{ minutes} - [2 \text{ minutes} \times (\text{nominal pipe size in inches})].$$

In other words, when θ is less than 1 degree (60 minutes), the grooved mechanical coupling (GMC) is considered a rigid coupling. If θ exceeds 1 degree (60 minutes), the GMC is regarded as either a coupling or a flexible coupling, depending on the specific application. The maximum angles θ for rigid couplings are shown in the table below:

Flexibility Proof Test

Flexibility proof testing is performed by applying a small bending moment—10% of the listed moment—to the test assembly, with no internal pressure applied. For example, a 4" Model 1N flexible coupling typically deflects between 3° and 4°, depending on the type of groove processing.



NFPA 13 defines a FLEXIBLE COUPLING as;

"a listed coupling or fitting that allow axial displacement,

Flexible couplings are designed to allow rotation and at least 1 degree of angular movement of the pipe without causing harm. For pipe diameters of 8 inches and larger, the angular movement may be less than 1 degree, but it must not be less than 0.5 degrees." (NFPA 13-2007, Section 3.5.4)

In sprinkler systems, NFPA 13 specifies the use of flexible couplings to protect the system from earthquake damage and provides specific guidelines on where and how these couplings should be applied

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 mm/in	Angular Movement Deflection		Size		Axial Displacement mm/in	Angular Movement (Deflection)	
Nom.Size mm/in	Actual OD mm/in		Per coupling degrees	Per pipe mm/m, in/ft	Nom.Size mm/in	Actual OD mm/in		Per coupling degrees	Per pipe mm/m, in/ft
25	33.4	1.6	5°-30'	96	150	165.1	3.2	2°-14'	39
1	1.315	0.0625		1.16	6	6.500	0.125		0.47
32	42.4	1.6	4°-20'	76	150	168.3	3.2	2°-10'	38
1.25	1.660	0.0625		0.91	6	6.625	0.125		0.45
40	48.3	1.6	3°-48'	66	200 JIS	216.3	3.2	1°-42'	30
1.5	1.900	0.0625		0.80	8	8.516	0.125		0.36
50	60.3	1.6	3°-01'	53	200	219.1	3.2	1°-40'	29
2	2.375	0.0625		0.63	8	8.625	0.125		0.35
65	73	1.6	2°-30'	44	250 JIS	267.4	3.2	1°-22'	24
2.5	2.875	0.0625		0.52	10	10.528	0.125		0.29
65	76.1	1.6	2°-24'	42	250	273.0	3.2	1°-20'	23
2.5	3.000	0.0625		0.50	10	10.750	0.125		0.28
80	88.9	1.6	2°-04'	36	300 JIS	318.5	3.2	1°-10'	20
3	3.500	0.0625		0.43	12	12.539	0.125		0.25
90	101.6	1.6	1°-48'	31	300	323.9	3.2	1°-08'	20
3.5	4.000	0.0625		0.38	12	12.750	0.125		0.24
100	108.0	3.2	3°-24'	59.0	350	355.6	3.2	1°-02'	18
4	4.25	0.125		0.71	14	14.000	0.125		0.22
100	114.3	3.2	3°-12'	55	400	406.4	3.2	0°-54'	16
4	4.500	0.125		0.67	16	16.000	0.125		0.19
125	127.0	3.2	2°-53'	50.0	450	457.0	3.2	0°-48'	14
5	5.000	0.125		0.60	18	18.000	0.125		0.17
125	133	3.2	2°-46'	48	500	508.0	3.2	0°-44'	13
5	5.250	0.125		0.58	20	20.000	0.125		0.15
125	139.7	3.2	2°-37'	46	550	559.0	3.2	0°-38'	11
5	5.500	0.125		0.55	22	22.000	0.125		0.13
125	141.3	3.2	2°-36'	45	600	610.0	3.2	0°-36'	10
5	5.563	0.125		0.54	24	24.000	0.125		0.13

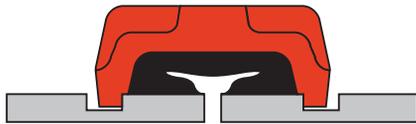
Note: Axial displacement is the maximum value when the system is pressurized to the maximum working pressure. Angular movement is the maximum value that a coupling allows under no internal pressure.

Rubber Gasket

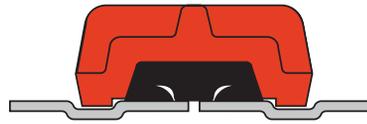


Wingrou gaskets are designed to provide long-lasting, life-of-the-system service in a wide variety of applications. Gasket materials are available to meet the requirements of most piping applications.

Couplings Gasket Type



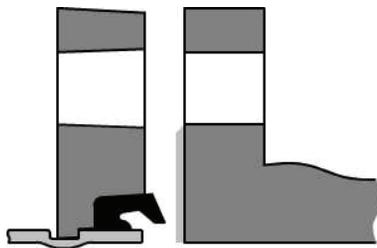
Standard C type:
Usually with grooved fittings. 1GS, 1X, 1N, 1NH, such as no special requirements are supporting this type of rubber seals



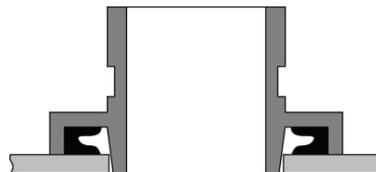
E type:
Usually with grooved fittings. 1GS, 1X, 1N, 1NH can be matched with this type of rubber seal



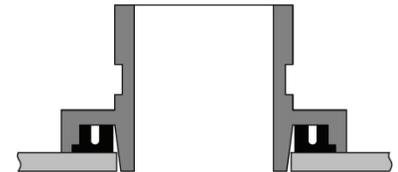
Reducing type :
Usually with grooved reducing fitting. 1NR supporting this type of rubber ring.



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

With advances in elastomer technology, Wingrou has introduced superior gasket materials to its product line, offering a variety of synthetic rubber gaskets for a wide range of applications.

For most water system piping applications, Wingrou recommends using Grade EPDM rubber. Wingrou's E-grade rubber gasket material offers excellent anti-aging and heat resistance. It maintains its physical properties during hot air aging tests at temperatures up to 125°C (257°F). In a water system, the rubber's anti-aging properties are further enhanced, as water does not deteriorate elastomers. As a result, temperature is the primary factor limiting the material's lifespan in water service.

Grade E elastomer delivers superior performance, making it ideal for hot water service up to 230°F (110°C). It outperforms previous gasket materials in key metrics, including temperature resistance, tensile strength, chemical resistance, and shelf life.

Rubber Gasket Data

To maximize service life, proper gasket selection and specification at the time of ordering are crucial. Key factors to consider include temperature, product concentration, service duration, and continuity. Exceeding the recommended temperature limits can degrade the polymer, creating a direct link between temperature, service continuity, and gasket lifespan.

The services listed are general recommendations only. There are applications for which these gaskets may not be suitable. For a list of application-specific recommendations and unsuitable applications, refer to the latest selection guide for seals.

It is important to note that gasket selection pertains only to the rubber materials used in the gasket. The selection of metal shells, fittings, bolts, and nuts should be based on the specific application environment.

Rubber Gasket Selection Guide

Grade	Temperature Range	Rubber Compound	Color Code	General Service Recommendations
E	-30°F to +230°F -34°C to +110°C	EPDM	Green Stripe	Recommended for hot water service within the specified temperature range, as well as a variety of dilute acids, oil-free air, and many chemical applications. UL classified in accordance with ANSI/NSF 61 for cold water service up to +86°F (+30°C) and hot water service up to +180°F (+82°C). 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 temperature 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 maximize the lifespan of the rubber seal in your application, it's essential to select the correct material and specifications at the time of ordering. Choosing the wrong material can result in personal injury, property damage, joint leakage, or connection failure.



Green Stripe

Orange Stripe

Blue Stripe

White Stripe

Yellow Stripe

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 the maximum allowed working pressure within the service temperature range of the gasket used in the coupling, based on standard wall or Schedule 40 steel pipe, cut or roll-grooved to ANSI/AWWA C606 (latest edition) specifications and tested to ASTM F1476. Burst test pressures are a minimum of three times the maximum working pressures unless otherwise specified.

These ratings may occasionally differ from the maximum working pressures listed and/or approved by UL, ULC, and/or FM, as testing conditions and test pipes may vary. For performance data on other pipe schedules, please contact Wingrou.

Note: For a one-time field test only, the maximum joint working pressure may be increased by up to 1½ times the figures shown.

04. Maximum End Load:

Maximum end loads listed represent the total internal and external forces to which the joint can be subjected, based on standard wall or Schedule 40 steel pipe, cut or roll-grooved to ANSI/AWWA C606 (latest edition) specifications

Nominal Size / Pipe O.D.

While Wingrou fittings are typically identified by nominal size, it is important to always check the actual outside diameter (O.D.) of the pipe and fittings to be connected, as different markets may use the same nominal size for pipes with varying O.D.s. For example, the nominal size 65 (2½") refers to a 73.0 mm (2.875") pipe O.D. in IPS and a 76.1 mm (3.000") pipe O.D. in BS, ISO, or JIS pipes. Refer to pipe and tubing standards for more 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 based on roll-grooved standard steel pipe. For cut-grooved pipe, these values will be double that of roll-grooved pipe. These values represent the maximum allowable displacement; for design and installation purposes, these figures should be reduced by:

50% for pipe sizes ¾"/DN20 to 3"/DN80
25% for pipe sizes 4"/DN100 and larger

This adjustment is made to account for jobsite conditions. The maximum allowable deflection of the pipe from the centerline applies 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
(CEN) European Committee for Standardization
(AFPA) Australian Fire Protection Association
(DCD) Dubai Civil Defense

HOUSING

Wingrou Coupling Housings are made from ductile iron, conforming to ASTM A536 Grade 65-45-12. Ductile iron is an ideal material for grooved mechanical components, offering strength comparable to or greater than that of wrought or cast steel.

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 conforming 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 %	Temperature operating Range
EPDM	Green Mark	65 ± 5	1.1%	5%	10.34 MPa 1500 PSI	300%	-34°C - 110°C -30°F - +230°F

BOLTS AND NUTS

Oval neck track bolt conforming 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

The user is solely responsible for determining the suitability of Wingrou products for a specific end-use application, in accordance with industry standards, project specifications, applicable building codes, regulations, and Wingrou's performance, maintenance, safety, and warning instructions. No document, nor any verbal recommendation, advice, or opinion from any Wingrou employee, shall alter, supersede, or waive any provision of Wingrou's standard conditions of sale, installation guide, or this disclaimer.

INSTALLATION INSTRUCTIONS:

01. Remove one nut and bolt from housing loosen the other nut 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 and push the gasket over one of the grooved ends of the two pipes to be joined. Gasket lip should not overhang pipe end.
04. Align and bring the pipes end together and slide gasket into position entered between the grooves on each pipe. Gasket should not extend into groove on either pipe.
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 tongue 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: Always depressurize and drain the piping system before installing, removing, or adjusting any piping products. Additionally, ensure that you wear safety glasses, a hard hat, and appropriate foot protection at all times.

Torque Value

When a torque value is specified for coupling installation, it must be applied to the nuts to ensure proper installation. However, applying torque beyond the specified value will not improve the seal. Exceeding the specified torque by more than 25% may damage the product and result 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

Torque Required! Bolts and nuts must always be tightened to the specified torque using a torque wrench. After the bolts and nuts are fully tightened, there may be small gaps between the bolt pads. These gaps should be equal on both sides of the coupling.

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 to maintain equal bolt pad gaps. The icons and information below will help identify these requirements and ensure correct assembly.

Metal-to-Metal Contact: Tighten the bolts and nuts until the bolt pads make metal-to-metal contact. Once contact is achieved, tighten the nuts an additional quarter to half turn to ensure the bolts and nuts are snug and secure. No torque wrench is required. Caution: Excessive torque can lead to bolt or joint failure, so avoid over-tightening.

Equal Bolt Pad Gaps: Other components require a specific bolt torque to maintain uniform gaps between the bolt pads. This ensures that the load is distributed evenly across the joint, which is essential for maintaining the integrity of the connection.

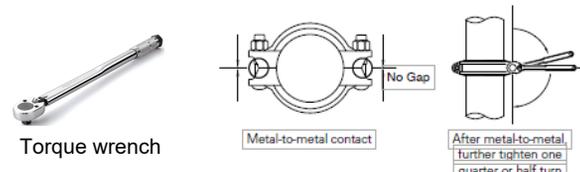
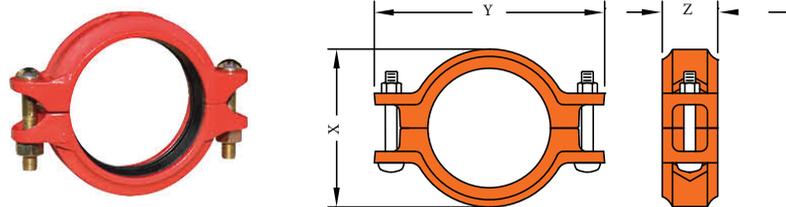
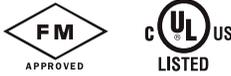


Figure-1GS



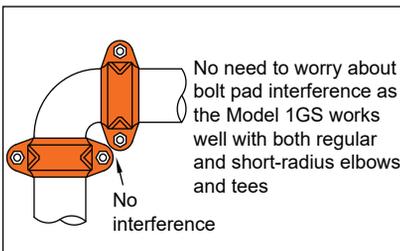
The Wingrou Model 1GS is a rigid coupling featuring a tongue-and-groove (T&G) mechanism, designed for moderate pressure applications where rigidity is critical. It is commonly used in valve connections, mechanical rooms, fire mains, and long straight pipe runs. The built-in teeth and T&G mechanism securely grip the pipe ends, eliminating unwanted flex and ensuring a firm, stable connection.

Support and hanging requirements correspond to ANSI B31.1, B31.9 and NFPA13.

Fitting Coating:

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

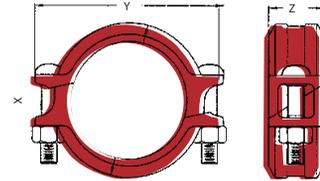
Part No.	Size		Max. Work Pressure	Max. End Load	Allow. Pipe End Sep.	Dimension			Bolt/Nut Size	Approx. Wgt. Each
	Nominal Dia	Actual O.D.				X	Y	Z		
	DN Inches	mm Inches								
WG1GS100	25	33.4	5170	4530	2.3	54	98	44	M10X50	0.55
	1	1.315	750	1020	0.091	2.126	3.858	1.732	3/8X2	1.21
WG1GS125	32	42.4	5170	7300	2.3	63	109	44	M10X50	0.58
	1 1/4	1.660	750	1620	0.091	2.480	4.291	1.732	3/8X2	1.28
WG1GS150	40	48.3	5170	9470	2.3	69	115	44	M10X50	0.60
	1 1/2	1.900	750	2130	0.091	2.717	4.528	1.732	3/8X2	1.32
WG1GS200	50	60.3	4140	11820	2.3	83	128	45	M10X50	0.71
	2	2.375	600	2660	0.091	3.268	5.039	1.772	3/8X2	1.56
WG1GS250	65	73.0	3780	15820	2.3	97	142	46	M10X55	0.98
	2 1/2	2.875	550	3570	0.091	3.819	5.591	1.811	3/8X2 1/4	2.16
WG1GS290	65	76.1	3780	17190	2.3	100	145	46	M10X55	0.97
	2 1/2	3.000	550	3890	0.091	3.937	5.709	1.811	3/8X2 1/4	2.13
WG1GS300	80	88.9	3780	23460	2.7	113	159	47	M10X55	1.10
	3	3.500	550	5290	0.106	4.449	6.260	1.850	3/8X2 1/4	2.42
WG1GS410	100	108.0	3450	31610	2.7	136	192	49	M12X70	1.44
	4	4.250	500	7090	0.106	5.354	7.559	1.929	1/2X2 3/4	3.17
WG1GS400	100	114.3	3450	35400	2.7	142	198	49	M12X70	1.54
	4	4.500	500	7950	0.106	5.591	7.795	1.929	1/2X2 3/4	3.39
WG1GS510	125	133.0	3450	47930	2.7	163	224	50	M16X85	1.95
	5	5.250	500	10820	0.106	6.417	8.819	1.969	5/8X3 3/8	4.30
WG1GS511	125	139.7	3450	52880	2.7	169	230	50	M16X85	2.00
	5	5.500	500	11880	0.106	6.654	9.055	1.969	5/8X3 3/8	4.41
WG1GS500	125	141.3	3450	54100	2.7	171	232	50	M16X85	2.02
	5	5.563	500	12150	0.106	6.732	9.134	1.969	5/8X3 3/8	4.45
WG1GS601	150	159.0	3450	68500	2.7	190	249	51	M16X85	2.20
	6	6.250	500	15340	0.106	7.480	9.803	2.008	5/8X3 3/8	4.85
WG1GS650	150	165.1	3450	73860	2.7	196	254	51	M16X85	2.26
	6	6.500	500	16590	0.106	7.717	10.000	2.008	5/8X3 3/8	4.98
WG1GS600	150	168.3	3450	76750	2.7	199	257	51	M16X85	2.34
	6	6.625	500	17240	0.106	7.835	10.118	2.008	5/8X3 3/8	5.15
WG1GS800	200	219.1	2750	103680	4.9	256	328	58	M20X115	4.00
	8	8.625	400	23370	0.193	10.079	12.913	2.283	3/4X4 1/2	8.81
WG1GS910	250	273.0	2500	146340	4.9	311	397	59	M22X135	5.17
	10	10.750	350	31770	0.193	12.244	15.630	2.323	7/8X5 1/2	11.39
WG1GS912	300	323.9	2500	205990	4.9	365	451	60	M22X135	6.86
	12	12.750	350	44690	0.193	14.370	17.756	2.362	7/8X5 1/2	15.11



- Working Pressure is based on roll grooved standard wall carbon steel
- Allowable axial displacement and angular movement (deflection) values are based on roll-grooved standard steel pipe. For cut-grooved pipe, these values will be double those for roll-grooved pipe. These values represent the maximum limits; for design and installation purposes, they should be reduced by:
50% for pipe sizes from 3/4" (DN20) to 3" (DN80)
25% for 4" (DN100) and larger sizes
This adjustment accounts for jobsite conditions.
- The maximum working pressure for fire protection applications should be based on the approved pressure values set by the relevant authorities.

UL/ULC: 300 psi (2065 kPa / 21 bars)
FM: 300 psi (2065 kPa / 21 bars)

Figure-1N



The Figure 1N Grooved End Flexible Couplings are designed to accommodate angular or rotational differences between the components being joined after assembly. These couplings enhance system reliability in applications involving excessive vibration, challenging 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				mm Inches	mm Inches	mm Inches		
WG1N100	25	33.4	5170	4530	2.2	53	98	44	M10X50	0.55
	1	1.315	750	1020	0.087	2.087	3.858	1.732	3/8X2	1.21
WG1N125	32	42.4	5170	7300	2.2	62	110	44	M10X50	0.58
	1 1/4	1.660	750	1620	0.087	2.441	4.331	1.732	3/8X2	1.28
WG1N150	40	48.3	5170	9470	2.2	68	115	44	M10X50	0.60
	1 1/2	1.900	750	2130	0.087	2.677	4.528	1.732	3/8X2	1.32
WG1N200	50	60.3	4140	11820	2.2	83	130	45	M10X50	0.71
	2	2.375	600	2660	0.087	3.268	5.118	1.772	3/8X2	1.56
WG1N250	65	73.0	3780	15820	2.4	97	144	46	M10X55	0.90
	2 1/2	2.875	550	3570	0.094	3.819	5.669	1.811	3/8X2 1/4	1.98
WG1N290	65	76.1	3780	17190	2.4	100	147	46	M10X55	1.00
	2 1/2	3.000	550	3890	0.094	3.937	5.787	1.811	3/8X2 1/4	2.20
WG1N300	80	88.9	3780	23460	2.8	113	172	47	M10X55	1.11
	3	3.500	550	5290	0.110	4.449	6.772	1.850	3/8X2 1/4	2.44
WG1N410	100	108.0	3450	31610	3.3	136	196	51	M12X70	1.62
	4	4.250	500	7090	0.130	5.354	7.717	2.008	1/2X2 3/4	3.57
WG1N400	100	114.3	3450	35400	3.3	142	202	51	M12X70	1.66
	4	4.500	500	7950	0.130	5.591	7.953	2.008	1/2X2 3/4	3.66
WG1N510	125	133.0	3450	47930	3.6	166	230	51	M16X85	2.37
	5	5.250	500	10820	0.142	6.535	9.055	2.008	5/8X3 3/8	5.22
WG1N511	125	139.7	3450	52880	3.6	172	236	51	M16X85	2.42
	5	5.500	500	11880	0.142	6.772	9.291	2.008	5/8X3 3/8	5.33
WG1N500	125	141.3	3450	54100	3.6	174	238	51	M16X85	2.44
	5	5.563	500	12150	0.142	6.850	9.370	2.008	5/8X3 3/8	5.37
WG1N601	150	159.0	3450	68500	3.9	190	266	52	M16X85	2.72
	6	6.250	500	15340	0.154	7.480	10.472	2.047	5/8X3 3/8	5.99
WG1N650	150	165.1	3450	73860	3.9	196	272	52	M16X85	2.78
	6	6.500	500	16590	0.154	7.717	10.709	2.047	5/8X3 3/8	6.12
WG1N600	150	168.3	3450	76750	3.9	199	275	52	M16X85	2.83
	6	6.625	500	17240	0.154	7.835	10.827	2.047	5/8X3 3/8	6.23
WG1N800	200	219.1	2750	103680	4.9	256	343	61	M20X115	5.06
	8	8.625	400	23370	0.193	10.079	13.504	2.402	3/4X4 1/2	11.15
WG1N910	250	273.0	2500	146340	4.9	311	397	61	M22X135	5.91
	10	10.750	350	31770	0.193	12.244	15.630	2.402	7/8X5 1/2	13.02
WG1N912	300	323.9	2500	205990	4.9	365	451	62	M22X135	7.39
	12	12.750	350	44690	0.193	14.370	17.756	2.441	7/8X5 1/2	16.28

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

* Allowable axial displacement and angular movement (deflection) values are based on roll-grooved standard steel pipe. For cut-grooved pipe, these values will be double those for roll-grooved pipe. These values represent maximum limits; for design and installation purposes, they should be reduced by:

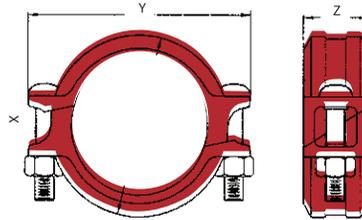
50% for pipe sizes from 3/4" (DN20) to 3" (DN80)
25% for 4" (DN100) and larger sizes
This adjustment accounts for jobsite conditions.

* The maximum working pressure for fire protection applications should be based on the approved pressure values set by the relevant authorities.

UL/UCLC: 300 psi (2065 kPa / 21 bars)

FM: 300 psi (2065 kPa / 21 bars)

Figure-1X



The Wingrou Model 1X is a standard rigid coupling with an angle-pad design, suitable for moderate pressure piping services such as fire mains, long straight runs, and valve connections. This angle-pad rigid coupling provides precise positioning of the pipe ends, ensuring a fixed pipe end separation. This fixed separation should be considered during design and installation.

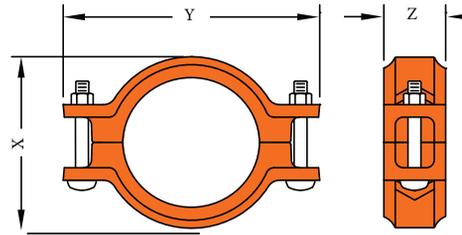


Part No.	Size		Max. Work Pressure	Max. End Load	Allow. Pipe End Sep.	Dimensions			Bolt/Nut Size	Approx. Wgt. Each
	Nominal Dia.	Actual O.D.				X	Y	Z		
	DN Inches	mm								
WG1X100	25	33.4	5170	4530	2.2	55	98	45	M10X50	0.49
	1	1.315	750	1020	0.086	2.165	3.858	1.772	3/8x2	1.08
WG1X125	32	42.4	5170	7300	2.2	64	110	45	M10X50	0.58
	1 1/4	1.660	750	1620	0.086	2.520	4.331	1.772	3/8x2	1.28
WG1X150	40	48.3	5170	9470	2.2	70	115	45	M10X50	0.62
	1 1/2	1.900	750	2130	0.086	2.756	4.528	1.772	3/8x2	1.37
WG1X200	50	60.3	4140	11820	2.2	85	130	47	M10X50	0.77
	2	2.375	600	2660	0.086	3.346	5.118	1.850	3/8x2	1.70
WG1X250	65	73.0	3780	15820	2.7	100	148	49	M10X55	0.98
	2 1/2	2.875	550	3570	0.106	3.937	5.827	1.929	3/8x2 1/4	2.16
WG1X290	65	76.1	3780	17190	2.7	103	151	49	M10X55	1.00
	2 1/2	3.000	550	3890	0.106	4.055	5.945	1.929	3/8x2 1/4	2.20
WG1X300	80	88.9	3780	23460	2.7	116	164	49	M10X55	1.11
	3	3.500	550	5290	0.106	4.567	6.457	1.929	3/8x2 1/4	2.44
WG1X410	100	108.0	3450	31610	3.3	138	188	51	M12X70	1.48
	4	4.250	500	7090	0.130	5.433	7.402	2.008	1/2x2 3/4	3.26
WG1X400	100	114.3	3450	35400	3.3	144	194	51	M12X70	1.52
	4	4.500	500	7950	0.130	5.669	7.638	2.008	1/2x2 3/4	3.35
WG1X510	125	133.0	3450	47930	3.3	165	226	51	M12X75	2.07
	5	5.250	500	10820	0.130	6.496	8.898	2.008	1/2x3	4.56
WG1X511	125	139.7	3450	52880	3.3	172	232	51	M12X75	2.12
	5	5.500	500	11880	0.130	6.772	9.134	2.008	1/2x3	4.67
WG1X500	125	141.3	3450	54100	3.3	173	234	51	M12X75	2.14
	5	5.563	500	12150	0.130	6.811	9.213	2.008	1/2x3	4.71
WG1X601	150	159.0	3450	68500	3.3	192	252	52	M12X75	2.42
	6	6.250	500	15340	0.130	7.559	9.921	2.047	1/2x3	5.33
WG1X650	150	165.1	3450	73860	3.3	198	258	52	M12X75	2.48
	6	6.500	500	16590	0.130	7.795	10.157	2.047	1/2x3	5.46
WG1X600	150	168.3	3450	76750	3.3	201	261	52	M12X75	2.53
	6	6.625	500	17240	0.130	7.913	10.276	2.047	1/2x3	5.57
WG1X800	200	219.1	2750	103680	4.9	260	325	61	M16X85	4.49
	8	8.625	400	23370	0.193	10.236	12.795	2.402	5/8x3 3/8	9.89
WG1X910	250	273.0	2500	146340	4.9	314	397	61	M20X115	5.53
	10	10.750	350	31770	0.193	12.362	15.630	2.402	3/4x4 1/2	12.18
WG1X912	300	323.9	2500	205990	4.9	368	451	62	M20X115	7.22
	12	12.750	350	44690	0.193	14.488	17.756	2.441	3/4x4 1/2	15.90

- Unique angle-pad design for rigidity
- Allows supporting/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

- 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 3/4"/DN20 - 3"/DN80; 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

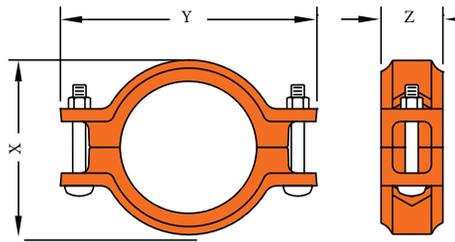


The Wingrou Figure1NH is an extra heavy flexible coupling designed for high pressure services up to 1000 psi (70 Bar). This flexible coupling is painted RAL 3000 red paint and is supplied with a standard C-shaped gasket and heavy duty bolts and nuts. The Model 1NH can be installed on standard roll or 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 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				mm Inches	mm Inches	mm Inches		
WG1NH100	25	33.4	10350	9068	2.2	57	101	44	M10X55	0.73
	1	1.315	1500	2037	0.087	2.244	3.976	1.732	3/8X2 1/4	1.61
WG1NH125	32	42.4	860	1214	2.2	66	113	45	M12X60	0.91
	1 1/4	1.660	1250	2705	0.087	2.598	4.449	1.772	1/2X2 3/8	2.00
WG1NH150	40	48.3	860	1576	2.2	72	121	45	M12X60	0.97
	1 1/2	1.900	1250	3544	0.087	2.835	4.764	1.772	1/2X2 3/8	2.14
WG1NH200	50	60.3	860	2456	2.2	87	138	47	M12X60	1.20
	2	2.375	1250	5538	0.087	3.425	5.433	1.850	1/2X2 3/8	2.64
WG1NH250	65	73.0	6900	28879	2.4	101	152	49	M12X75	1.52
	2 1/2	2.875	1000	6492	0.094	3.976	5.984	1.929	1/2X3	3.35
WG1NH290	65	76.1	6900	31384	2.4	104	155	49	M12X75	1.54
	2 1/2	3.000	1000	7069	0.094	4.094	6.102	1.929	1/2X3	3.39
WG1NH300	80	88.9	6900	42830	2.8	118	170	49	M12X75	1.71
	3	3.500	1000	9621	0.110	4.646	6.693	1.929	1/2X3	3.77
WG1NH410	100	108.0	6900	63210	3.3	142	206	51	M16X85	2.60
	4	4.250	1000	14186	0.130	5.591	8.110	2.008	5/8X3 3/8	5.73
WG1NH400	100	114.3	6900	70800	3.3	148	212	51	M16X85	2.67
	4	4.500	1000	15904	0.130	5.827	8.346	2.008	5/8X3 3/8	5.88
WG1NH510	125	133.0	6900	95861	3.6	169	243	51	M20X115	3.58
	5	5.250	1000	21648	0.142	6.654	9.567	2.008	3/4X4 1/2	7.89
WG1NH511	125	139.7	6900	105763	3.6	176	249	51	M20X115	3.65
	5	5.500	1000	23758	0.142	6.929	9.803	2.008	3/4X4 1/2	8.04
WG1NH500	125	141.3	6900	108199	3.6	177	251	51	M20X115	3.67
	5	5.563	1000	24306	0.142	6.969	9.882	2.008	3/4X4 1/2	8.08
WG1NH601	150	159.0	6900	137004	3.9	197	271	51	M20X115	4.05
	6	6.250	1000	30680	0.154	7.756	10.669	2.008	3/4X4 1/2	8.92
WG1NH650	150	165.1	6900	147718	3.9	203	277	51	M20X115	4.13
	6	6.500	1000	33183	0.154	7.992	10.906	2.008	3/4X4 1/2	9.10
WG1NH600	150	168.3	6900	153500	3.9	206	279	51	M20X115	4.15
	6	6.625	1000	34472	0.154	8.110	10.984	2.008	3/4X4 1/2	9.14
WG1NH800	200	219.1	5500	207366	4.9	267	357	63	M22X135	8.35
	8	8.625	800	46741	0.193	10.512	14.055	2.480	7/8X5 1/2	18.39
WG1NH910	250	273.0	5500	321943	4.9	320	410	65	M24X135	10.70
	10	10.750	800	72610	0.193	12.598	16.142	2.559	1X5 1/2	23.57
WG1NH912	300	323.9	5500	453185	4.9	370	460	65	M24X135	12.30
	12	12.750	800	102141	0.193	14.567	18.110	2.559	1X5 1/2	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 3/4"/DN20 - 3"/DN80; 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 500 Psi 3447 kPa/ 34.47 bars.

Figure-1GH

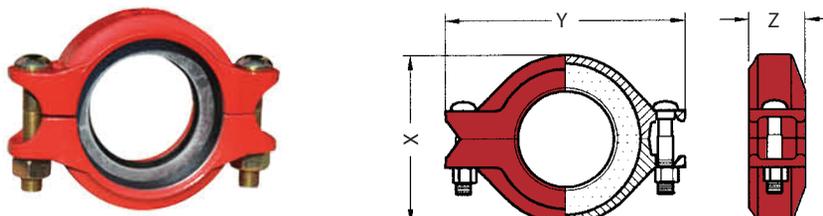


The Wingrou Figure1GH is an extra heavy duty rigid coupling is designed for use in a variety of general piping applications of moderate or high pressure services. Working pressure is usually dictated by the wall thickness and rating of the pipe being used. The couplings feature flexibility that can accommodate misalignment, distortion, thermal stress, vibration, noise and seismic tremors. The Model can even accommodate an arced or curved piping layout

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				mm Inches	mm Inches	mm Inches		
WGIGH100	25	33.4	10350	9068	2.2	57	101	44	M10X55	0.73
	1	1.315	1500	2037	0.087	2.244	3.976	1.732	3/8X2 1/4	1.61
WGIGH125	32	42.4	860	1214	2.2	66	113	45	M12X60	0.91
	1 1/4	1.660	1250	2705	0.087	2.598	4.449	1.772	1/2X2 3/8	2.00
WGIGH150	40	48.3	860	1576	2.2	72	121	45	M12X60	0.97
	1 1/2	1.900	1250	3544	0.087	2.835	4.764	1.772	1/2X2 3/8	2.14
WGIGH200	50	60.3	860	2456	2.2	87	138	47	M12X60	1.20
	2	2.375	1250	5538	0.087	3.425	5.433	1.850	1/2X2 3/8	2.64
WGIGH250	65	73.0	6900	28879	2.4	101	152	49	M12X75	1.52
	2 1/2	2.875	1000	6492	0.094	3.976	5.984	1.929	1/2X3	3.35
WGIGH290	65	76.1	6900	31384	2.4	104	155	49	M12X75	1.54
	2 1/2	3.000	1000	7069	0.094	4.094	6.102	1.929	1/2X3	3.39
WGIGH300	80	88.9	6900	42830	2.8	118	170	49	M12X75	1.71
	3	3.500	1000	9621	0.110	4.646	6.693	1.929	1/2X3	3.77
WGIGH410	100	108.0	6900	63210	3.3	142	206	51	M16X85	2.60
	4	4.250	1000	14186	0.130	5.591	8.110	2.008	5/8X3 3/8	5.73
WGIGH400	100	114.3	6900	70800	3.3	148	212	51	M16X85	2.67
	4	4.500	1000	15904	0.130	5.827	8.346	2.008	5/8X3 3/8	5.88
WGIGH510	125	133.0	6900	95861	3.6	169	243	51	M20X115	3.58
	5	5.250	1000	21648	0.142	6.654	9.567	2.008	3/4X4 1/2	7.89
WGIGH511	125	139.7	6900	105763	3.6	176	249	51	M20X115	3.65
	5	5.500	1000	23758	0.142	6.929	9.803	2.008	3/4X4 1/2	8.04
WGIGH500	125	141.3	6900	108199	3.6	177	251	51	M20X115	3.67
	5	5.563	1000	24306	0.142	6.969	9.882	2.008	3/4X4 1/2	8.08
WGIGH610	150	159.0	6900	137004	3.9	197	271	51	M20X115	4.05
	6	6.250	1000	30680	0.154	7.756	10.669	2.008	3/4X4 1/2	8.92
WGIGH610	150	165.1	6900	147718	3.9	203	277	51	M20X115	4.13
	6	6.500	1000	33183	0.154	7.992	10.906	2.008	3/4X4 1/2	9.10
WGIGH600	150	168.3	6900	153500	3.9	206	279	51	M20X115	4.15
	6	6.625	1000	34472	0.154	8.110	10.984	2.008	3/4X4 1/2	9.14
WGIGH800	200	219.1	5500	207366	4.9	267	357	63	M22X135	8.35
	8	8.625	800	46741	0.193	10.512	14.055	2.480	7/8X5 1/2	18.39
WGIGH910	250	273.0	5500	321943	4.9	320	410	65	M24X135	10.70
	10	10.750	800	72610	0.193	12.598	16.142	2.559	1X5 1/2	23.57
WGIGH912	300	323.9	5500	453185	4.9	370	460	65	M24X135	12.30
	12	12.750	800	102141	0.193	14.567	18.110	2.559	1X5 1/2	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 3/4"/DN20 - 3"/DN80; 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 500 Psi 3447 kPa/ 34.47 bars.

Figure-1NR



- 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 responsive 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 Pressure	Max. End Load	Allow. Pipe End Sep.	Dimensions			Bolt/Nut Size	Approx. Wgt. Each	
	Run Pipe	X				Bran Pipe	X	Y			Z
	mm Inches	X mm Inches				mm Inches	mm Inches	mm Inches			mm Inches
WG1NR150X125	48.3 1 1/2	X	42.4 1 1/4	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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	2060 300	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 3/4"/DN20 - 3"/DN80; 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.

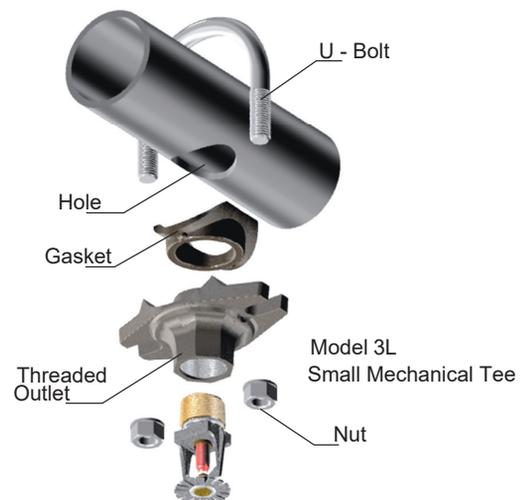
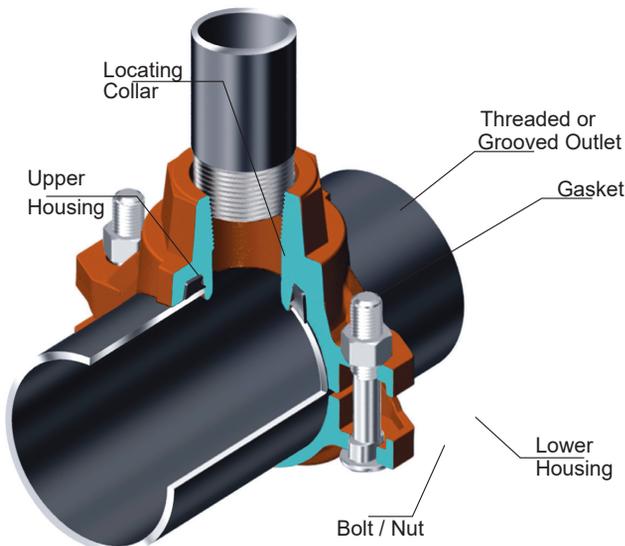
INSTALLATION INSTRUCTIONS:

01. The 3GS/3JS is a bolted saddle-type fitting with grooved outlets, designed to reduce branch outlets without welding. Its design ensures superior sealing, full pipe support, excellent stability, and easy installation.
02. Remove one nut and bolt from housing loosen the other nut until it flush with the end of the bolt.
03. Check suitability of gasket for intended service . Reposition the gasket into 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 halves.
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. Torque in excess of what is recommended is not desirable.



WARNING: Depressurize and drain the piping system before attempting to install, remove, or adjust any piping products. Always wear safety glasses, a hard hat, and appropriate foot protection to ensure personal safety during the process.

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

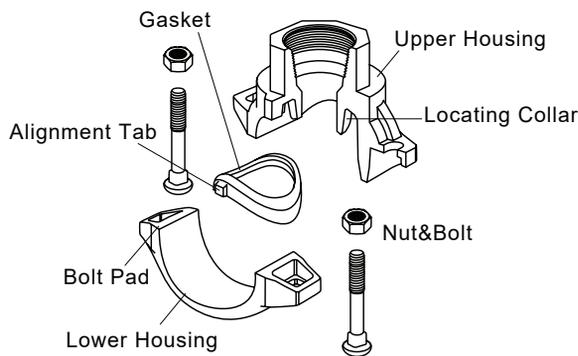
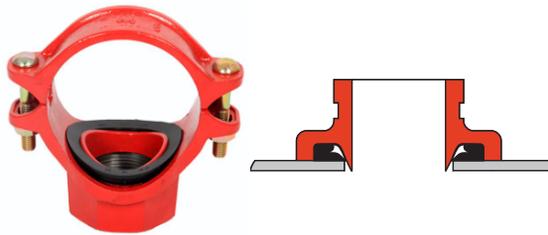


● Grooved-end and threaded outlets are available

Mechanical Tees

Wingrou mechanic a I 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.



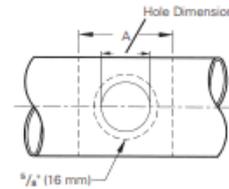
When bolts are tightened with a proper torque, the outlet housing makes metal to metal contact with the outer surface of the pipe.



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 $\frac{5}{8}$ " (16 mm) of the hole should be inspected to ensure a clean smooth surface, free of any indentations or projections that could affect proper gasket sealing. The area within the "A" dimension should also be inspected and must be free 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



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 multiple 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		mm Inches			mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches		mm Inches	mm Inches	kg Lbs.	kg Lbs.
	mm Inches	X X														
WG3G/3J200100	60.3 2	X 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 1/2X2 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 1/2X2 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 1/2X2 1/2	0.91 2.00	0.98 2.16		
WG3G/3J250100	73.0 2 1/2	X 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 1/2X3	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 1/2X3	1.28 2.82	1.33 2.93		
WG3G/3J250150			48.3 1 1/2	3450 500	44.5 2.00	43 1.69	148 5.83	83 3.27	74 2.91	67 2.64	46 1.81	M12X75 1/2X3	1.39 3.06	1.52 3.35		
WG3G/3J290100	76.1 2 1/2	X 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 1/2X3	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 1/2X3	1.22 2.69	1.27 2.80		
WG3G/3J290150			48.3 1 1/2	3450 500	44.5 2.00	45 1.77	151 5.94	83 3.27	76 2.99	69 2.72	47 1.85	M12X75 1/2X3	1.27 2.80	1.33 2.93		
WG3G/3J300100	88.9 3	X 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 1/2X3	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 1/2X3	1.31 2.89	1.36 3.00		
WG3G/3J300150			48.3 1 1/2	3450 500	44.5 2.00	52 2.05	161 6.34	82 3.23	82 3.23	75 2.95	54 2.13	M12X75 1/2X3	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 1/2X3	1.44 3.17	1.56 3.44		
WG3G/3J410100	108.0 4	X 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 1/2X3	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 1/2X3	1.52 3.35	1.56 3.44		
WG3G/3J410150			48.3 1 1/2	3450 500	44.5 2.00	62 2.44	182 7.17	83 3.27	93 3.66	86 3.39	65 2.56	M12X75 1/2X3	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 1/2X3	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 1/2X3	1.91 4.21	2.13 4.69		
WG3G/3J400100	114.3 4	X 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 1/2X3	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 1/2X3	1.55 3.41	1.58 3.48		
WG3G/3J400150			48.3 1 1/2	3450 500	44.5 2.00	65 2.56	188 7.40	83 3.27	96 3.78	89 3.50	68 2.68	M12X75 1/2X3	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 1/2X3	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 1/2X3	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 1/2X3	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 1/2X3	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.

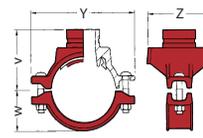
Figure-3G/3J



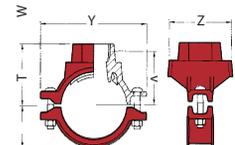
**Model 3G Grooved
Outlet Mechanical Tee**



**Model
3J Threaded
Mechanical Tee**



**Model 3G Grooved
Outlet Mechanical Tee**



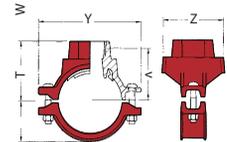
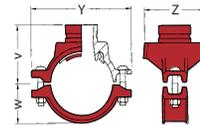
**Model
3J Threaded
Mechanical Tee**

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 Inches	mm X Inches											
WG3G/3J200100	133.0 X 5	33.4 X 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 3/8	2.71 5.97	3.04 6.70
WG3G/3J290100	139.7 X 5	33.4 X 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 3/8	2.77 6.10	3.1 6.83
WG3G/3J300200	141.3 X 5	33.4 X 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 3/8	2.77 6.10	3.1 6.83
WG3G/3J400100	159.0 X 6	33.4 X 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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



Model 3G Grooved Outlet Mechanical Tee

Model 3J Threaded Mechanical Tee

Model 3G Grooved Outlet Mechanical Tee

Model 3J Threaded 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.

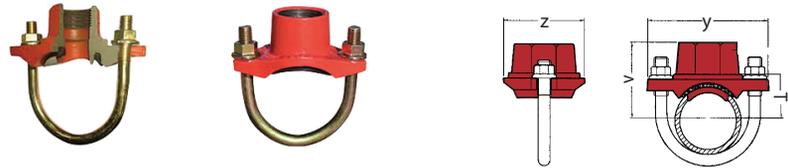
Size Run Pipe X Branch Pipe	Max. Work Pressure KPa PSI	Hole Size mm Inches	Dimensions						Bolt/Nut Size mm Inches	Approx. Wgt.	
			W mm Inches	Y mm Inches	Z mm Inches	3G V mm Inches	3J V mm Inches	3J T mm Inches		3G kg Lbs.	3J kg Lbs.
165.1 X 33.4 6 1	3450 500	38 1.50	95 3.74	124 4.88	114 4.49	92 3.62	257 10.12	68 2.68	M16X85 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 3/8	3.44 7.58	--
168.3 X 33.4 6 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 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 5/8X3 3/8	3.52 7.75	--
219.1 X 33.4 8 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 3/4X4 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 3/4X4 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 3/4X4 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 3/4X4 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 3/4X4 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 3/4X4 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 3/4X4 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 3/4X4 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 3/4X4 1/2	5.31 11.70	--

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

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 and drill a hole at the desired outlet location. Position 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).



Hole Cutting

The method of pipe preparation requires cutting or drilling a specified hole size on the centerline of the pipe. Always use the correct hole saw size as indicated in the table and never use a torch for cutting the hole. After the hole is cut, all rough edges must be removed. Additionally, the area within 5/8" (16 mm) of the hole should be thoroughly inspected to ensure the surface is clean, smooth, and 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

Size			Max. Working Pressure	Hole Size	Dimensions				Bolt/Nut Size	Approx. Wgt.
Run Pipe	X Branch Pipe				Y	Z	V	T		
mm	mm	mm	KPa	mm	mm	mm	mm	mm	kg	
Inches	Inches	Inches	PSI	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
			350	1.20	3.46	2.25	1.81	1.10	3/8 X 2 1/16 X 1 1/2	0.70
		26.9	2500	30.5	88	57	46	30	M10 X 68 X 38	0.34
			350	1.20	3.46	2.25	1.81	1.81	3/8 X 2 1/16 X 1 1/2	0.75
		33.4	2500	30.5	88	57	52	34	M10 X 68 X 38	0.40
			350	1.20	3.46	2.25	2.05	1.34	3/8 X 2 1/16 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
			350	1.20	3.46	2.25	1.77	1.22	3/8 X 2 1/16 X 1 1/2	0.70
		26.9	2500	30.5	88	57	48	33	M10 X 68 X 38	0.34
			350	1.20	3.46	2.25	1.89	1.30	3/8 X 2 1/16 X 1 1/2	0.75
		33.4	2500	30.5	88	57	55	37	M10 X 68 X 38	0.40
			350	1.20	3.46	2.25	2.17	1.46	3/8 X 2 1/16 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
			350	1.20	3.70	2.25	2.00	1.46	3/8 X 2 15/16 X 1 1/8	0.73
		26.9	2500	30.5	94	57	54	39	M10 X 74 X 47	0.35
			350	1.20	3.70	2.25	2.13	1.54	3/8 X 2 15/16 X 1 1/8	0.77
		33.4	2500	30.5	94	57	61	43	M10 X 74 X 47	0.41
			350	1.20	3.70	2.25	2.40	1.69	3/8 X 2 15/16 X 1 1/8	0.90
73	x	21.3	2500	30.5	108	57	57	43	M10 X 89X 57	0.49
			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
			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
			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
			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
			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
			350	1.20	4.25	2.25	2.72	2.00	3/8 X 3 1/2 X 2 1/4	1.26

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 flange of the device to be joined



Add the 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. Always wear safety glasses, a hard hat, and appropriate foot protection to ensure personal safety during the process.

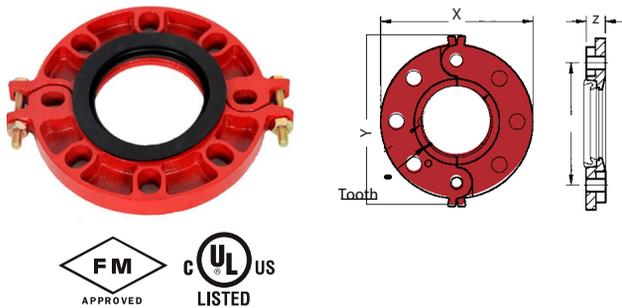
- Wingrou Style 321 Grooved Flange is designed to provide a rigid transition from a flanged component to a grooved piping system. Grooved
- Flanges are supplied as per ANSI Class 125 drilling pattern as standard. Other drilling patterns PN16 or ANSI Class 150 are available as optional. Groove Dimensions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

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

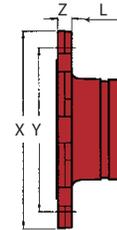
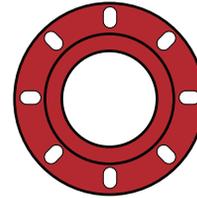
Size		Max. Work Pressure	PCD c	Dimensions			Bolt/Nut Size	Approx. Wgt. Each
Nominal Dia.	Actual O.D.			X	Y	Z		
DN Inches	mm Inches	BAR PSI	mm inches	mm Inches	mm Inches	mm Inches	kg Lbs.	
50	60.3	20	120.5	165	218	20	M10X70	1.76
2	2.375	300	4.75	6.496	8.583	0.787	3/8X2 3/4	3.87
65	73.0	20	140	178	228	22	M10X70	2.04
2 1/2	2.875	300	5.51	7.008	8.976	0.866	3/8X2 3/4	4.50
65	76.1	20	140	185	238	22	M10X70	2.41
2 1/2	3.000	300	5.51	7.283	9.370	0.866	3/8X2 3/4	5.30
80	88.9	20	153	200	250	22	M10X70	2.55
3	3.500	300	6.02	7.874	9.843	0.866	3/8X2 3/4	5.62
100	114.3	20	191	229	280	24	M10X70	3.24
4	4.500	300	7.52	9.016	11.02	0.945	3/8X2 3/4	7.14
125	139.7	20	216	250	313	22	M12X70	3.49
5	5.500	300	8.50	9.843	12.32	0.866	1/2X2 3/4	7.68
125	141.3	20	216	254	321	26	M12X70	4.39
5	5.563	300	8.50	10.00	12.64	1.024	1/2X2 3/4	9.67
150	165.1	20	241	285	347	24	M12X70	4.55
6	6.500	300	9.49	11.22	13.66	0.945	1/2X2 3/4	10.02
150	168.3	20	241	285	345	26	M12X70	4.73
6	6.625	300	9.49	11.22	13.58	1.024	1/2X2 3/4	10.42
200	219.1	20	299	343	404	30	M12X70	6.95
8	8.625	300	11.77	13.50	15.91	1.181	1/2X2 3/4	15.31
250	273.0	20	362.0	407	472	28	M12 X 70	8.30
10	10.750	300	14.25	16.02	18.58	1.101	1/2 X 3/4	18.30
300	323.9	20	431.0	462	527	28	M12 X 70	9.80
12	12.750	300	16.96	18.19	20.75	1.101	1/2 X 3/4	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 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 recommendation, 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 conforming ASTM A-536, Every lot is metallurgical examined to ensure compliance

Available with external or internal threaded ends as optional

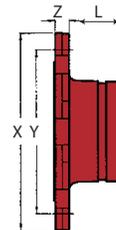
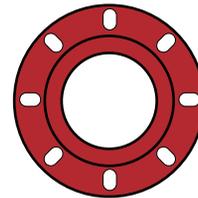
Fitting Coating:

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

Size		Max. Work Pressure	L	Dimensions			Bolt/Nut Size	Approx. Wgt. Each
Nominal Dia.	Actual O.D.			X	Y	Z		
DN Inches	mm Inches	BAR PSI	mm inches	mm Inches	mm Inches	mm Inches	Lbs Kg.	
50	60.3	20	45	165	125	15	M10 X 70	3.87
2	2.375	300	1.77	6.49	4.92	0.59	3/8 X 2 3/4	1.76
65	73.0	20	45	182	145	15	M10 X 70	4.50
2 1/2	2.875	300	1.77	7.16	5.70	0.59	3/8 X 2 3/4	2.04
65	76.1	20	45	182	145	15	M10 X 70	5.30
2 1/2	3.000	300	1.77	7.16	5.70	0.59	3/8 X 2 3/4	2.41
80	88.9	20	45	199	160	15	M10 X 70	5.62
3	3.500	300	1.77	7.83	6.30	0.59	3/8 X 2 3/4	2.55
100	114.3	20	50	226	180	17	M10 X 70	7.14
4	4.500	300	1.96	8.86	7.09	0.66	3/8 X 2 3/4	3.24
125	139.7	20	50	253	210	18	M12X70	7.68
5	5.500	300	1.96	9.96	8.27	0.70	1/2 X 2 3/4	3.49
125	141.3	20	50	253	210	19	M12X70	9.67
5	5.563	300	1.96	10.00	8.27	0.74	1/2 X 2 3/4	4.39
150	165.1	20	50	285	240	19	M12X70	10.02
6	6.500	300	1.96	11.22	9.45	0.74	1/2 X 2 3/4	4.55
150	168.3	20	50	285	240	19	M12X70	10.02
6	6.625	300	1.96	11.22	9.45	0.74	1/2 X 2 3/4	4.55
200	219.1	20	55	345	295	19	M12X70	15.31
8	8.625	300	2.16	13.58	11.61	0.74	1/2 X 2 3/4	6.95
250	273.0	20	105	405	355	22	M12 X 70	15.80
10	10.750	300	4.13	15.94	13.97	0.86	1/2 X 3/4	34.83
300	323.9	20	105	455	410	22	M12 X 70	40.34
12	12.750	300	4.13	17.91	16.14	0.86	1/2 X 3/4	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 PN16/150



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

Confirms to class ANSI 150 lb Flange and BS 4504 class PN 16 flange drilling (Universal flanges)

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

Fitting Coating:

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

Size		Max. Work Pressure	L	Dimensions			Bolt/Nut Size	Approx. Wgt. Each
Nominal Dia.	Actual O.D.			X	Y	Z		
DN Inches	mm Inches	BAR PSI	mm inches	mm Inches	mm Inches	mm Inches	Lbs. Kg.	
50	60.3	20	45	165	125	15	M10 X 70	3.87
2	2.375	300	1.77	6.49	4.92	0.59	3/8 X 2 3/4	1.76
65	73.0	20	45	182	145	15	M10 X 70	4.50
2 1/2	2.875	300	1.77	7.16	5.70	0.59	3/8 X 2 3/4	2.04
65	76.1	20	45	182	145	15	M10 X 70	5.30
2 1/2	3.000	300	1.77	7.16	5.70	0.59	3/8 X 2 3/4	2.41
80	88.9	20	45	199	160	15	M10 X 70	5.62
3	3.500	300	1.77	7.83	6.30	0.59	3/8 X 2 3/4	2.55
100	114.3	20	50	226	180	17	M10 X 70	7.14
4	4.500	300	1.96	8.86	7.09	0.66	3/8 X 2 3/4	3.24
125	139.7	20	50	253	210	18	M12X70	7.68
5	5.500	300	1.96	9.96	8.27	0.70	1/2 X 2 3/4	3.49
125	141.3	20	50	253	210	19	M12X70	9.67
5	5.563	300	1.96	10.00	8.27	0.74	1/2 X 2 3/4	4.39
150	165.1	20	50	285	240	19	M12X70	10.02
6	6.500	300	1.96	11.22	9.45	0.74	1/2 X 2 3/4	4.55
150	168.3	20	50	285	240	19	M12X70	10.02
6	6.625	300	1.96	11.22	9.45	0.74	1/2 X 2 3/4	4.55
200	219.1	20	55	345	295	19	M12X70	15.31
8	8.625	300	2.16	13.58	11.61	0.74	1/2 X 2 3/4	6.95
250	273.0	20	105	405	355	22	M12 X 70	15.80
10	10.750	300	4.13	15.94	13.97	0.86	1/2 X 3/4	34.83
300	323.9	20	105	455	410	22	M12 X 70	40.34
12	12.750	300	4.13	17.91	16.14	0.86	1/2 X 3/4	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



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 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 recommendation, 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- 90 STD Pattern Elbow

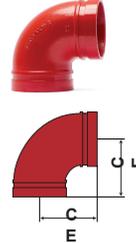


Figure- 130 STD Pattern Equal Tee

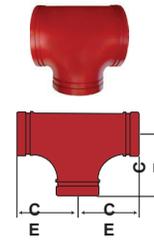
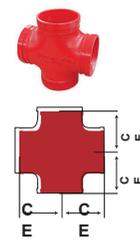


Figure- 180 STD Pattern Equal Cross



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
1¼	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
1½	1.900	2.75	1.10	2.75	1.98	2.75	2.42
50	60.3	83	0.6	83	1.4	83	1.7
2	2.375	3.25	1.32	3.25	3.08	3.25	3.74
65	73.0	95	0.8	95	2.2	95	2.7
2½	2.875	3.75	1.76	3.75	4.85	3.75	5.95
65	76.1	95	1.0	95	2.4	95	2.8
2½	3.000	3.75	2.20	3.75	5.29	3.75	6.17
80	88.9	108	1.3	108	3.0	108	4.8
3	3.500	4.25	2.86	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	2.1	127	5.4	127	7.2
4	4.500	5.00	4.63	5.00	11.89	5.00	15.86
125	133.0	140	3.4	140	8.0	140	9.0
5	5.250	5.50	7.49	5.50	17.62	5.50	19.82
125	139.7	140	3.5	140	8.1	140	9.1
5	5.500	5.50	7.71	5.50	17.84	5.50	20.04
125	141.3	140	3.6	140	8.1	140	9.2
5	5.563	5.50	7.93	5.50	17.84	5.50	20.26
150	159.0	165	5.2	165	10.1	165	12.6
6	6.250	6.50	11.45	6.50	22.25	6.50	27.75
150	165.1	165	5.4	165	10.3	165	12.7
6	6.500	6.50	11.89	6.50	22.69	6.50	27.97
150	168.3	165	5.6	165	10.4	165	12.7
6	6.625	6.50	12.33	6.50	22.91	6.50	27.97
200	219.1	197	10.50	197	21.6	197	24.8
8	8.625	7.75	23.13	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 contraction of the pipe system.

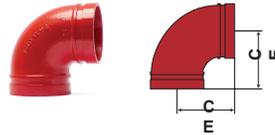
When assembling Wingrou couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop

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

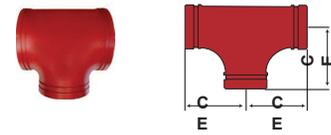
Figure-90, 130, 180



**Figure- 90 STD
Pattern Elbow**



**Figure- 130 STD
Pattern Equal Tee**



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:

- 14",16",18",20",24"

Material:

- Ductile iron with rust inhibiting paint

Fitting Coating:

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

Size		Working Pressure	Model90° Std. Elbow		Model 30 Std. Equal Tee	Certificate
Nominal Dia.	Actual O.D.		Dimensions.		CE	
mm	mm	PSI/MPa	mm	mm	mm	UL/FM
Inches	Inches		Inches	Inches	Inches	
350	355.6	300	280	280	-	
14	14.000	2.07	11.02	11.02	-	
350	377.0	300	279	279	-	
14	14.843	2.07	10.98	10.98	-	
400	406.4	300	305	305	-	
16	16.000	2.07	12.00	12.00	-	
400	426.0	300	305	285	-	
16	16.772	2.07	12.00	11.22	-	
450	457.2	300	394	342	-	
18	18.000	2.07	15.50	13.46	-	
500	508.0	300	438	381	-	
20	20.000	2.07	17.25	15.00	-	
600	609.6	300	508	432	-	
24	24.000	2.07	20.00	17.01	-	

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.

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/21 bars FM 300Psi 2065kPa/21 Bars

Figure-90S,130S,180S,



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.

Figure- 90S Short Pattern Elbow



Figure- 130S Short Pattern

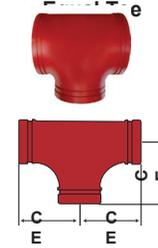
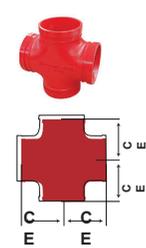


Figure- 180S Short Pattern Equal Cross



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.
50	60.3	70	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	76	1.5	95	2.2	95	2.7
2½	2.875	3.00	3.30	3.75	4.85	3.75	5.95
65	76.1	76	1.7	95	2.4	95	2.8
2½	3.000	3.00	3.74	3.75	5.29	3.75	6.17
80	88.9	86	2.0	108	3.0	108	4.8
3	3.500	3.40	4.41	4.25	6.61	4.25	10.57
100	108.0	102	3.0	127	5.2	127	7.1
4	4.250	4.00	6.61	5.00	11.45	5.00	15.64
100	114.3	102	3.2	127	5.4	127	7.2
4	4.500	4.00	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	140	7.8	165	10.1	165	12.6
6	6.250	5.50	17.18	6.50	22.25	6.50	27.75
150	165.1	140	7.8	165	10.3	165	12.7
6	6.500	5.50	17.18	6.50	22.69	6.50	27.97
150	168.3	140	7.8	165	10.4	165	12.7
6	6.625	5.50	17.18	6.50	22.91	6.50	27.97
200	219.1	173	13.6	197	21.6	197	24.8
8	8.625	6.80	29.96	7.75	47.58	7.75	54.62

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.

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



Figure- 120 45° Elbow

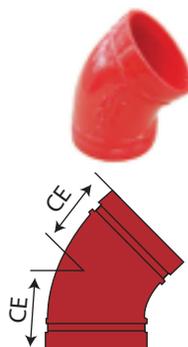


Figure- 110 22.5° Elbow



Figure- 105 11.25° Elbow



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 45° Elbow		Model 110 22.5° Elbow		Model 105 11.25° 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
2½	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
2½	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

GROOVED REDUCING TEE



Figure-131,131N

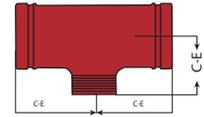
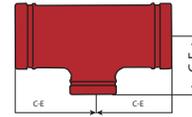


Figure- 131 Grooved Red. Tee Figure- 131N Threaded Red. Tee Figure- 131 Grooved Reducing Tee Figure-131N Threaded Reducing Tee

Size	Model 131 Reducing Tee		Model 131N Reducing Tee	
	CE	Approx. Wgt.	CE	Approx. Wgt.
Run Pipe X Branch Pipe	mm	kg	mm	kg
mm X mm Inches X Inches	Inches	Lbs.	Inches	Lbs.
42.4 X 33.4 1 1/4 1	57 2.25	0.5 1.10	57 2.25	0.6 1.32
48.3 X 33.4 1 1/2 1	70 2.75	0.6 1.32	70 2.75	0.6 1.32
42.4 1 1/4	70 2.75	0.7 1.54	70 2.75	0.7 1.54
60.3 X 33.4 2 1	70 2.75	0.7 1.54	70 2.75	0.8 1.76
42.4 1 1/4	70 2.75	0.8 1.76	70 2.75	0.8 1.76
48.3 1 1/2	70 2.75	0.8 1.76	70 2.75	0.8 1.76
73.0 X 33.4 2 1/2 1	76 3.00	1.1 2.42	76 3.00	1.1 2.42
42.4 1 1/4	76 3.00	1.1 2.42	76 3.00	1.1 2.42
48.3 1 1/2	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 X 33.4 2 1/2 1	76 3.00	1.2 2.64	76 3.00	1.2 2.64
42.4 1 1/4	76 3.00	1.2 2.64	76 3.00	1.3 2.86
48.3 1 1/2	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 X 33.4 3 1	86 3.40	1.4 3.08	86 3.40	1.4 3.08
42.4 1 1/4	86 3.40	1.4 3.08	86 3.40	1.5 3.30
48.3 1 1/2	86 3.40	1.5 3.30	86 3.40	1.6 3.52
73.0 2 1/2	86 3.40	1.6 3.52	86 3.40	1.6 3.52
76.1 2 1/2	86 3.40	1.6 3.52	86 3.40	1.6 3.52
114.3 X 33.4 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	
	CE	Approx. Wgt.	CE	Approx. Wgt.
Run Pipe X Branch Pipe	mm	kg	mm	kg
mm X mm Inches X Inches	Inches	Lbs.	Inches	Lbs.
114.3 X 42.4 4 1 1/4	102 4.00	2.5 5.51	102 4.00	2.5 5.51
48.3 1 1/2	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 2 1/2	102 4.00	2.6 5.73	102 4.00	2.7 5.95
76.1 2 1/2	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 33.4 5 1	124 4.88	4.1 9.03	124 4.88	4.1 9.03
42.4 1 1/4	124 4.88	4.1 9.03	124 4.88	4.2 9.25
48.3 1 1/2	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 2 1/2	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 33.4 5 1	124 4.88	4.1 9.03	124 4.88	4.1 9.03
42.4 1 1/4	124 4.88	4.1 9.03	124 4.88	4.2 9.25
48.3 1 1/2	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 2 1/2	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-131,131N

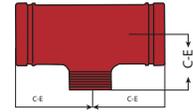
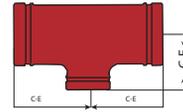


Figure- 131 Grooved Red. Tee

Figure- 131N Threaded Red. Tee

Figure- 131 Grooved Reducing Tee

Figure-131N Threaded Reducing Tee

Size Run Pipe X Branch Pipe mm X mm Inches X Inches	Model 131 Reducing Tee		Model 131N Reducing Tee	
	CE mm Inches	Approx. Wgt. kg Lbs.	CE mm Inches	Approx. Wgt. kg Lbs.
165.1 X 33.4 6 1	140 5.50	6.3 13.88	140 5.50	6.3 13.88
42.4 1 1/4	140 5.50	6.3 13.88	140 5.50	6.4 14.10
48.3 1 1/2	140 5.50	6.3 13.88	140 5.50	6.4 14.10
60.3 2	140 5.50	6.4 14.10	140 5.50	6.4 14.10
76.1 2 1/2	140 5.50	6.4 14.10	140 5.50	6.5 14.32
88.9 3	140 5.50	6.5 14.32	140 5.50	6.5 14.32
114.3 4	140 5.50	6.7 14.76	-- --	-- --
139.7 5	140 5.50	6.9 15.20	-- --	-- --
168.3 X 33.4 6 1	140 5.50	6.3 13.88	140 5.50	6.3 13.88
42.4 1 1/4	140 5.50	6.3 13.88	140 5.50	6.4 14.10
48.3 1 1/2	140 5.50	6.3 13.88	140 5.50	6.4 14.10
60.3 2	140 5.50	6.4 14.10	140 5.50	6.4 14.10
73.0 2 1/2	140 5.50	6.4 14.10	140 5.50	6.5 14.32
88.9 3	140 5.50	6.5 14.32	140 5.50	6.5 14.32
114.3 4	140 5.50	6.7 14.76	-- --	-- --
141.3 5	140 5.50	6.9 15.20	-- --	-- --
219.1 X 33.4 8 1	173 6.80	11.1 24.45	173 6.80	11.1 24.45
42.4 1 1/4	173 6.80	11.3 24.89	173 6.80	11.4 25.11
48.3 1 1/2	173 6.80	11.5 25.33	173 6.80	11.6 25.55
60.3 2	173 6.80	11.9 26.21	173 6.80	12.0 26.43
73.0 2 1/2	173 6.80	12.0 26.43	173 6.80	12.1 26.65

Size Run Pipe X Branch Pipe mm X mm Inches X Inches	Model 131 Reducing Tee	
	CE mm Inches	Approx. Wgt. kg Lbs.
219.1 X 76.1 8 2 1/2	173 6.80	12.1 26.65
88.9 3	173 6.80	12.1 26.65
114.3 4	173 6.80	12.3 27.09
139.7 5	173 6.80	12.5 27.53
141.3 5	173 6.80	12.5 27.53
165.1 6	173 6.80	12.7 27.97
168.3 6	173 6.80	12.8 28.19
273.0 X 114.3 10 4	229 9.00	21.5 47.36
139.7 5	229 9.00	23.8 52.42
141.3 5	229 9.00	23.8 52.42
165.1 6	229 9.00	25.4 55.95
168.3 6	229 9.00	25.4 55.95
219.1 8	229 9.00	26.3 57.93
323.9 X 114.3 12 4	254 10.00	29.1 64.10
139.7 5	254 10.00	31.2 68.72
141.3 5	254 10.00	31.2 68.72
165.1 6	254 10.00	32.9 72.47
168.3 6	254 10.00	32.9 72.47
219.1 8	254 10.00	33.7 74.23
273.0 10	254 10.00	34.3 75.55

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	X	mm	mm	kg	mm	kg
Inches	X	Inches	Inches	Lbs.	Inches	Lbs.
42.4	X	33.4	64	0.2	64	0.3
1 1/4	X	1	2.50	0.44	2.50	0.66
48.3	X	33.4	64	0.3	64	0.3
1 1/2	X	1	2.50	0.66	2.50	0.66
		42.4	64	0.3	64	0.4
		1 1/4	2.50	0.66	2.50	0.88
60.3	X	33.4	64	0.3	64	0.4
2	X	1	2.50	0.66	2.50	0.88
		42.4	64	0.4	64	0.4
		1 1/4	2.50	0.88	2.50	0.88
		48.3	64	0.4	64	0.4
		1 1/2	2.50	0.88	2.50	0.88
73.0	X	33.4	64	0.5	64	0.5
2 1/2	X	1	2.50	1.10	2.50	1.10
		42.4	64	0.5	64	0.5
		1 1/4	2.50	1.10	2.50	1.10
		48.3	64	0.5	64	0.5
		1 1/2	2.50	1.10	2.50	1.10
		60.3	64	0.5	64	0.5
		2	2.50	1.10	2.50	1.10
76.1	X	33.4	64	0.5	64	0.5
2 1/2	X	1	2.50	1.10	2.50	1.10
		42.4	64	0.5	64	0.5
		1 1/4	2.50	1.10	2.50	1.10
		48.3	64	0.5	64	0.6
		1 1/2	2.50	1.10	2.50	1.32
		60.3	64	0.6	64	0.6
		2	2.50	1.32	2.50	1.32
88.9	X	33.4	64	0.6	64	0.6
3	X	1	2.50	1.32	2.50	1.32
		42.4	64	0.6	64	0.6
		1 1/4	2.50	1.32	2.50	1.32
		48.3	64	0.6	64	0.7
		1 1/2	2.50	1.32	2.50	1.54
		60.3	64	0.7	64	0.7
		2	2.50	1.54	2.50	1.54
		73.0	64	0.7	64	0.7
		2 1/2	2.50	1.54	2.50	1.54
		76.1	64	0.7	64	0.7
		2 1/2	2.50	1.54	2.50	1.54
114.3	X	33.4	76	0.9	76	0.9
4	X	1	3.00	1.98	3.00	1.98

Size			Model 240 Concentric Reducer		Model 240N Concentric Reducer	
Run Pipe	X	Branch Pipe	EE	Approx. Wgt.	EE	Approx. Wgt.
mm	X	mm	mm	kg	mm	kg
Inches	X	Inches	Inches	Lbs.	Inches	Lbs.
114.3	X	42.4	76	0.9	76	1.0
4	X	1 1/4	3.00	1.98	3.00	2.20
		48.3	76	1.0	76	1.0
		1 1/2	3.00	2.20	3.00	2.20
		60.3	76	1.0	76	1.1
		2	3.00	2.20	3.00	2.42
		73.0	76	1.1	76	1.1
		2 1/2	3.00	2.42	3.00	2.42
		76.1	76	1.1	76	1.1
		2 1/2	3.00	2.42	3.00	2.42
		88.9	76	1.1	76	1.1
		3	3.00	2.42	3.00	2.42
139.7	X	33.4	89	1.4	89	1.4
5	X	1	3.50	3.08	3.50	3.08
		42.4	89	1.4	89	1.4
		1 1/4	3.50	3.08	3.50	3.08
		48.3	89	1.4	89	1.5
		1 1/2	3.50	3.08	3.50	3.30
		60.3	89	1.5	89	1.5
		2	3.50	3.30	3.50	3.30
		76.1	89	1.5	89	1.6
		2 1/2	3.50	3.30	3.50	3.52
		88.9	89	1.6	89	1.6
		3	3.50	3.52	3.50	3.52
		114.3	89	1.7	--	--
		4	3.50	3.74	--	--
141.3	X	33.4	89	1.4	89	1.4
5	X	1	3.50	3.08	3.50	3.08
		42.4	89	1.4	89	1.4
		1 1/4	3.50	3.08	3.50	3.08
		48.3	89	1.4	89	1.5
		1 1/2	3.50	3.08	3.50	3.30
		60.3	89	1.5	89	1.5
		2	3.50	3.30	3.50	3.30
		73.0	89	1.5	89	1.6
		2 1/2	3.50	3.30	3.50	3.52
		88.9	89	1.6	89	1.6
		3	3.50	3.52	3.50	3.52
		114.3	89	1.7	--	--
		4	3.50	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		Size			Model 240 Concentric Reducer		Model 240N Concentric Reducer	
Run Pipe	X	Branch Pipe	EE	Approx. Wgt.	EE	Approx. Wgt.	Branch Pipe	EE	Approx. Wgt.	EE	Approx. Wgt.	EE	Approx. Wgt.
mm X		mm	mm	kg	mm	kg	mm X	mm	kg	mm	kg	mm	kg
Inches X		Inches	Inches	Lbs.	Inches	Lbs.	Inches X	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.
165.1	X	33.4	102	2.1	102	2.1	219.1	X	76.1	127	4.3	127	4.5
6		1	4.00	4.66	4.00	4.66	8		2 1/2	5.00	9.47	5.00	9.91
		42.4	102	2.1	102	2.2			88.9	127	4.5	127	4.5
		1 1/4	4.00	4.66	4.00	4.85			3	5.00	9.91	5.00	9.91
		48.3	102	2.2	102	2.2			114.3	127	4.6	--	--
		1 1/2	4.00	4.85	4.00	4.85			4	5.00	10.13	--	--
		60.3	102	2.2	102	2.3			139.7	127	4.8	--	--
		2	4.00	4.85	4.00	5.07			5	5.00	10.57	--	--
		76.1	102	2.3	102	2.3			141.3	127	4.8	--	--
		2 1/2	4.00	5.07	4.00	5.07			5	5.00	10.57	--	--
		88.9	102	2.3	102	2.4			165.1	127	5.0	--	--
		3	4.00	5.07	4.00	5.29			6	5.00	11.00	--	--
		114.3	102	2.4	--	--			168.3	127	5.0	--	--
		4	4.00	5.29	--	--			6	5.00	11.00	--	--
		139.7	102	2.7	--	--	273.0	X	114.3	152	7.5	--	--
		5	4.00	5.99	--	--	10		4	6.00	16.52	--	--
		168.3	102	2.1	102	2.2			139.7	152	7.6	--	--
		6	4.00	4.66	4.00	4.85			5	6.00	16.74	--	--
		42.4	102	2.1	102	2.2			141.3	152	7.6	--	--
		1 1/4	4.00	4.66	4.00	4.85			5	6.00	16.74	--	--
		48.3	102	2.2	102	2.2			165.1	152	7.8	--	--
		1 1/2	4.00	4.85	4.00	4.85			6	6.00	17.18	--	--
		60.3	102	2.2	102	2.3			168.3	152	7.8	--	--
		2	4.00	4.85	4.00	5.07			6	6.00	17.18	--	--
		73.0	102	2.3	102	2.3			219.1	152	8.8	--	--
		2 1/2	4.00	5.07	4.00	5.07			8	6.00	19.38	--	--
		88.9	102	2.3	102	2.4	323.9	X	114.3	178	9.9	--	--
		3	4.00	5.07	4.00	5.29	12		4	7.00	21.81	--	--
		114.3	102	2.4	--	--			139.7	178	10.0	--	--
		4	4.00	5.29	--	--			5	7.00	22.03	--	--
		141.3	102	2.7	--	--			141.3	178	10.0	--	--
		5	4.00	5.99	--	--			5	7.00	22.03	--	--
219.1	X	33.4	127	4.1	127	4.2			165.1	178	10.2	--	--
8		1	5.00	9.03	5.00	9.25			6	7.00	22.47	--	--
		42.4	127	4.2	127	4.3			168.3	178	10.3	--	--
		1 1/4	5.00	9.25	5.00	9.47			6	7.00	22.69	--	--
		48.3	127	4.2	127	4.3			219.1	178	11.2	--	--
		1 1/2	5.00	9.25	5.00	9.47			8	7.00	24.67	--	--
		60.3	127	4.3	127	4.4			273.0	178	13.8	--	--
		2	5.00	9.47	5.00	9.69			10	7.00	30.40	--	--
		73.0	127	4.3	127	4.4							
		2 1/2	5.00	9.47	5.00	9.69							

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

GROOVED ECCENTRIC REDUCER



Figure-230,230N



Model 230 Eccentric Reducer

Model 230N Threaded Concentric 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	mm	kg	mm	kg
Inches	X	Inches	Inches	Lbs.	Inches	Lbs.
42.4	X	33.4	64	0.2	64	0.3
1 1/4	X	1	2.50	0.44	2.50	0.66
48.3	X	33.4	64	0.3	64	0.3
1 1/2	X	1	2.50	0.66	2.50	0.66
		42.4	64	0.3	64	0.4
		1 1/4	2.50	0.66	2.50	0.88
60.3	X	33.4	64	0.3	64	0.4
2	X	1	2.50	0.66	2.50	0.88
		42.4	64	0.4	64	0.4
		1 1/4	2.50	0.88	2.50	0.88
		48.3	64	0.4	64	0.4
		1 1/2	2.50	0.88	2.50	0.88
73.0	X	33.4	64	0.5	64	0.5
2 1/2	X	1	2.50	1.10	2.50	1.10
		42.4	64	0.5	64	0.5
		1 1/4	2.50	1.10	2.50	1.10
		48.3	64	0.5	64	0.5
		1 1/2	2.50	1.10	2.50	1.10
		60.3	64	0.5	64	0.5
		2	2.50	1.10	2.50	1.10
		76.1	64	0.5	64	0.5
		2 1/2	2.50	1.10	2.50	1.10
		42.4	64	0.5	64	0.5
		1 1/4	2.50	1.10	2.50	1.10
		48.3	64	0.5	64	0.6
		1 1/2	2.50	1.10	2.50	1.32
		60.3	64	0.6	64	0.6
		2	2.50	1.32	2.50	1.32
		88.9	64	0.6	64	0.6
		3	2.50	1.32	2.50	1.32
		42.4	64	0.6	64	0.6
		1 1/4	2.50	1.32	2.50	1.32
		48.3	64	0.6	64	0.7
		1 1/2	2.50	1.32	2.50	1.54
		60.3	64	0.7	64	0.7
		2	2.50	1.54	2.50	1.54
108.0	X	33.4	76	0.9	76	0.9
4	X	1	3.00	1.98	3.00	1.98
		42.4	76	0.9	76	1.0
		1 1/4	3.00	1.98	3.00	2.20
		48.3	76	1.0	76	1.0
		1 1/2	3.00	2.20	3.00	2.20

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



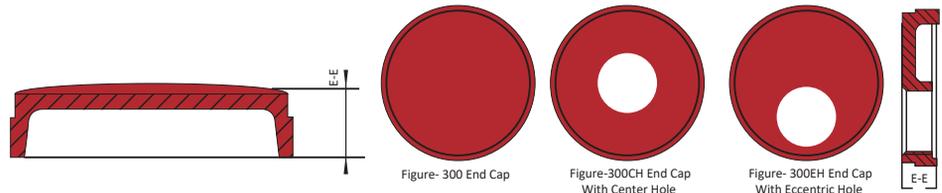
Model 230N Threaded Concentric Reducer

Size Run Pipe X Branch Pipe mm X mm Inches X Inches	Model 240 Concentric Reducer		Model 240N Concentric Reducer	
	EE	Approx. Wgt.	EE	Approx. Wgt.
	mm Inches	kg Lbs.	mm Inches	kg Lbs.
165.1 X 60.3 6 X 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 X 60.3 6 X 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 X 60.3 8 X 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 Run Pipe X Branch Pipe mm X mm Inches X Inches	Model 230 Eccentric Reducer		Model 230N Eccentric Reducer	
	EE	Approx. Wgt.	EE	Approx. Wgt.
	mm Inches	kg Lbs.	mm Inches	kg Lbs.
273.0 X 108.0 10 X 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 X 108.0 12 X 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



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 alternative to expensive swaged nipple



Figure-300 End Cap



Figure- 300EH Transition Cap



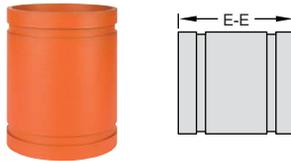
Figure- 300CH End Cap With Center Hole

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	mm	mm	kg	mm	kg	mm	kg
Inches	Inches	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.
25	33.4	28	0.1	---	---	---	---
1	1.315	1.10	0.22	---	---	---	---
32	42.4	28	0.13	---	---	---	---
1 1/4	1.660	1.10	0.29	---	---	---	---
40	48.3	28	0.15	---	---	---	---
1 1/2	1.900	1.10	0.33	---	---	---	---
50	60.3	37	0.22	25	0.31	25	0.25
2	2.375	1.46	0.48	1.00	0.68	1.00	0.55
65	73.0	37	0.3	25	0.36	25	0.36
2 1/2	2.875	1.46	0.66	1.00	0.79	1.00	0.79
65	76.1	37	0.32	25	0.38	25	0.38
2 1/2	3.000	1.46	0.7	1.00	0.84	1.00	0.84
80	88.9	41	0.41	25	0.52	25	0.52
3	3.500	1.61	0.9	1.00	1.15	1.00	1.15
100	108.0	51	0.69	25	0.8	25	0.8
4	4.250	2.00	1.52	1.00	1.76	1.00	1.76
100	114.3	51	0.71	25	0.82	25	0.82
4	4.500	2.00	1.56	1.00	1.81	1.00	1.81
125	133.0	51	1.04	25	1.15	25	1.15
5	5.250	2.00	2.29	1.00	2.53	1.00	2.53
125	139.7	51	1.11	25	1.23	25	1.23
5	5.500	2.00	2.44	1.00	2.71	1.00	2.71
125	141.3	51	1.12	25	1.24	25	1.24
5	5.563	2.00	2.47	1.00	2.73	1.00	2.73
150	159.0	55	1.38	25	1.56	25	1.56
6	6.250	2.17	3.04	1.00	3.44	1.00	3.44
150	165.1	55	1.45	25	1.68	25	1.68
6	6.500	2.17	3.19	1.00	3.7	1.00	3.7
150	168.3	55	1.51	25	1.72	25	1.72
6	6.625	2.17	3.33	1.00	3.79	1.00	3.79
200	219.1	68	3.13	30	3.71	30	3.71
8	8.625	13.00	6.89	1.18	8.17	1.18	8.17
250	273.0	75	5.52	32	6.17	32	6.17
10	10.750	2.95	12.16	1.25	13.59	1.25	13.59
300	323.9	81	8.44	32	9.73	32	9.73
12	12.750	3.20	18.59	1.25	21.43	1.25	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

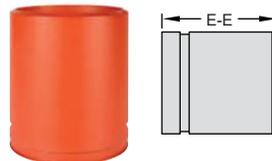
Wingrou standard fitting pressure ratings conform to the ratings of Model 1GS couplings. Material: Carbon steel Sch. 40 pipe to ASTM A53 Surface Finish: Black / Red

Grooved x Grooved



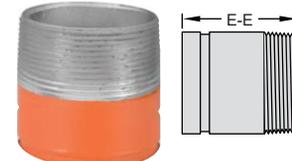
Gr. x Gr.

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

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

- 1 1/2" – 12"/DN40 – DN300

Pipe Material

- Carbon steel

Material Gasket

- EPDM Gasket

Coatings

Housings (specify choice):

Red enamel in Europe, Middle East, Africa, and India.

Orange enamel in USA

Optional: Hot dipped galvanized.

Housing:

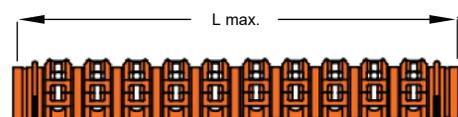
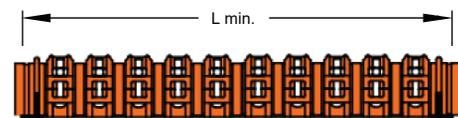
Standard: Ductile iron conforming to ASTM A536, Grade 65-45-12.

Fitting Coating:

RAL 3000Red Paint Europe, Middle East, Africa, and India.

Orange enamel in USA

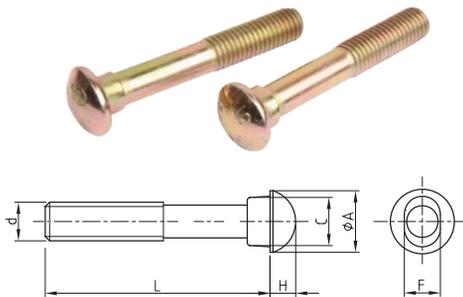
Optional: Hot dipped galvanized.



Nominal Size	Pipe O.D.	Couplings (Standard Units)	Max. Working Pressure	Max. Movement	L - (ref.)		Weight
					Min. (Compressed) (Expanded)	Max.	
in mm	in mm	Model No. No.	PSI Bar	in mm	in mm	in mm	Lbs Kgs
1 1/2 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
2 1/2 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.

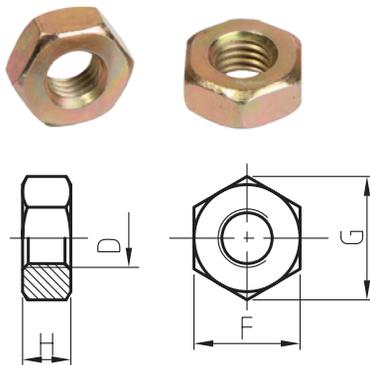
Metric Oval Neck Track Bolt



1. Oval Neck track bolt conforming to ASTM A183.
2. Tensile strength minimum 110,000 Psi
3. Bolt are yellow chromate electroplated

d	A	C	F	H	L
M10	18.5	13.5	9.5	5	50/57/63/70/89
M12	23.5	17.5	12.3	8	70/76/82/89/108
M16	29.5	20.5	15.7	10	85/89/95/108
M20	38	27	18.3	12.5	110/115
M22	42.2	31	21.4	14	125/140/150

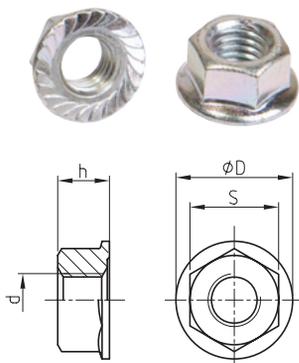
Metric Heavy Hex Nut



1. Nuts conform to ASTM A194
2. Thread: ISO 261, tolerance 6h for M10 & M12, 7h for M16 and above.
3. Surface Treatment: Zinc Electroplated followed by a yellow chromate

d	F		G	H	
	Min	Max	Min	Min	Max
M10	15.73	16.0	17.7	8.0	8.4
M12	21.16	22.0	23.9	9.34	10.0
M16	23.16	24.0	26.17	14.1	15.9
M20	29.16	30.0	32.95	16.9	19.0
M22	33.0	34.0	37.29	18.1	20.2

Hexagon Flange Nut



Dimension according to DIN6923.

d	S		D	h	
	Min	Max	Max	Min	Max
M8	12.3	13	17.9	7.6	8
M10	14.73	15.0	21.8	9.64	10
M12	17.73	18.0	26.0	11.57	12.0

GASKET LUBRICATION

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	
	<ul style="list-style-type: none">• 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. <p>Failure to follow these instructions could cause improper product installation, resulting in serious personal injury and/or property damage.</p>

LUBRICATION

Lubrication of the gasket with a thin coating of a compatible lubricant on the exterior gasket sealing lips or the interior surfaces of the coupling housings and pipe ends is essential to prevent gasket pinching. Additionally, proper lubrication facilitates the installation of the gasket onto the pipe end. Refer to the photos below for examples of both 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 specifies the minimum pipe lengths that can be safely grooved using Wingrou Grooving Tools. It also indicates the maximum pipe lengths that can be grooved without requiring a pipe stand. For pipe lengths exceeding those listed in the table, a pipe stand is necessary. Always consult the operating and maintenance manual for the specific grooving tool to ensure proper setup and grooving techniques.

Pipe Lengths Suitable For Grooving

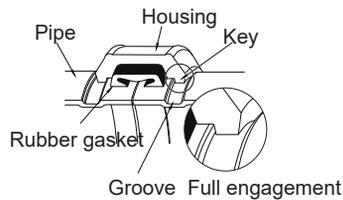


Size		Length - inches/mm	
Nominal Size inches or mm	Actual Pipe Outside Diameter inches/mm	Minimum	Maximum
1	1.315	8	36
	33.7	205	915
1 ¼	1.660	8	36
	42.4	205	915
1 ½	1.900	8	36
	48.3	205	915
2	2.375	8	36
	60.3	205	915
2 ½	2.875	8	36
	73.0	205	915
76.1 mm	3.000	8	36
	76.1	205	915
3	3.500	8	36
	88.9	205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

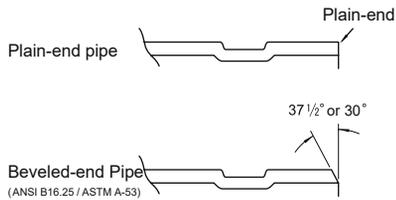
Roll grooves are generally applicable to .375"/9.5mm thick or thinner wall carbon steel pipe, stainless steel pipe, copper tube, aluminum pipe and PVC pipe depending on the type of roll-grooving machine and roll set being used. Different wall thicknesses and sizes require the use of different roll sets 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
12	12.750	300	323.9

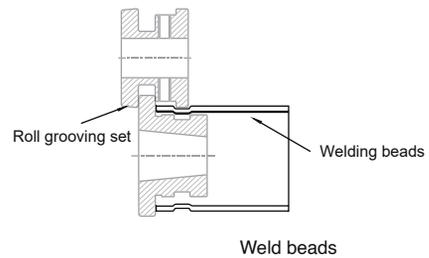
Comparative Advantages	Threaded	Flanged	Welded	Grooved
Allows angular deflection-misalignment	---	---	---	✓
Reclaimable, contraction or, no need for expansion joint Reclaimable, no need for union	---	---	---	✓
Allows fast connection with valves	---	✓	---	✓
Allows rotation of pipe for alignment	---	✓	---	✓
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 $37\frac{1}{2} \pm 2\frac{1}{2}^\circ$ or 30° as specified in ANSI B16.25 and ASTM A-53 respectively.



Wingrou Grooving Machine Model No. TWG-IIAB



ERW Pipe

ERW (Electric Resistance Welded) pipe is widely used today. However, depending on the pipe and manufacturer, welding beads may be present on the inside and outside surfaces. It is crucial to remove any harmful weld beads near the pipe ends, as they can cause rattling in the roll grooving machine, leading to inaccurate grooves.

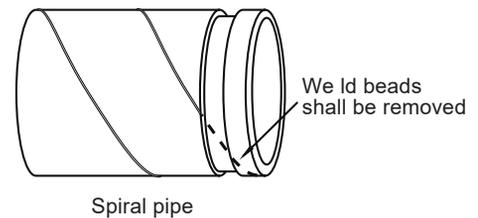
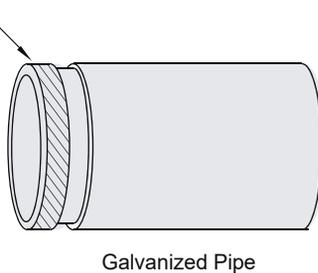
Spiral welded Pipe

Spiral welded pipe can be used, provided that 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 illustrated below. When removing weld beads or projections from the gasket seating surface, exercise caution to avoid over-grinding. After grinding, always apply a suitable rust-prevention coating to the treated area.

Galvanized pipe

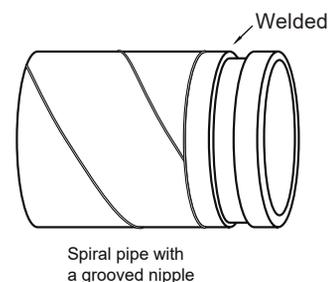
Galvanized pipe is acceptable as long as the gasket seating surface is smooth and free from scale or imperfections that could affect gasket sealing. When removing welding beads or projections from the sealing surface of galvanized pipe, exercise caution to avoid over-grinding. After grinding, always apply a suitable rust-prevention coating to the area.

Check gasket seating surface



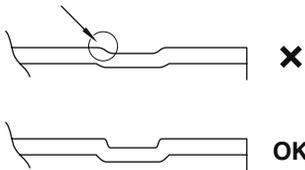
Weld Beads

ERW (Electric Resistance Welded) pipe is among the most commonly used types of pipe today. Depending on the pipe and manufacturer, welding beads may be present on both the inside and outside surfaces. Always remove any weld beads near the pipe ends, as they can cause rattling of the roll grooving machine, resulting in inaccurate grooves.



Stainless steel pipe

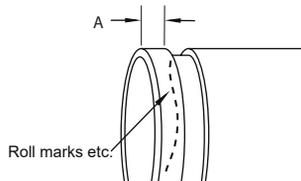
Stainless steel pipe is generally more challenging to groove than carbon steel pipe because achieving well-defined groove corners on stainless steel is more difficult. Grooves that are not well-defined and have excessive radii can lead to joint failure. It is essential to process grooves as precisely as possible. To address this, roll-groove machine manufacturers offer a variety of roll sets tailored to different pipe materials and wall thicknesses. Always ensure you select the correct roll set for the type of pipe being grooved to achieve the sharp corners necessary for a secure joint.



Caution: Using the same roll set for both carbon steel and stainless steel pipe can result in the transfer of rust or scale to the stainless steel during the grooving process. To avoid this, it is recommended to use a separate roll set specifically designated for stainless steel pipe. Additionally, ensure that roll-grooved stainless steel pipe remains dry prior to installation.

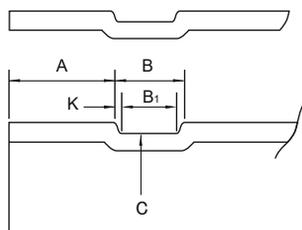
Gasket Seating Surface (A):

The exterior surface of the gasket seating area must be free from indentations, projections, roll marks, or other harmful defects. This includes removing any loose paint, scale, dirt, chips, grease, and rust to ensure a proper seal.



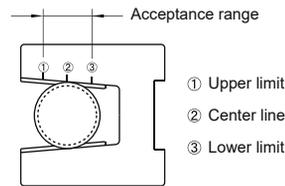
Roll groove profile

Roll grooves should be as defined as possible to ensure optimum joint performance. The "K" dimension, which represents the distance from the end of the pipe to the beginning of the groove, should be as small as possible. To achieve the best groove profile, the machine operator should carefully manage the feed pressure of the upper roll set during the grooving process.



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.

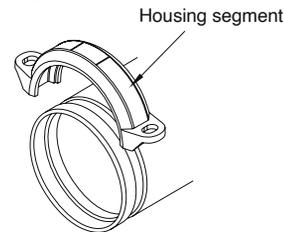


Groove diameter check



Use Wingrou Groove measuring tape

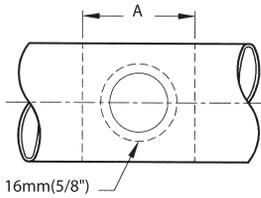
Or you can use a coupling housing for a quick check after verification of the groove dimensions. When using a housing segment as a reference always make up a sample and verify the diameter is within the acceptable range. If the housing fits well you may choose to use this as a reference gauge.



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. This method involves cutting or drilling a specified hole size on the centerline of the pipe. Always use the correct hole saw size as specified in this catalog and never use a torch for cutting the hole. After cutting the hole, remove all rough edges and inspect the area within 5/8" (16 mm) of the hole to ensure it is clean and smooth, free of any indentations or projections that could affect proper gasket sealing. Additionally, inspect the area within the "A" dimension to ensure it is free of dirt, scale, or any imperfections that could impact the 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	38	41	89
1/2, 3/4, 1	1-1/2	1-5/8	3-1/2
32, 40	44.5, 51*	54*	102
1-1/4, 1-1/2	1-3/4, 2	2-1/8	4
50	64	67	114
2	2-1/2	2-5/8	4-1/2
65	70	73	121
2-1/2	2-3/4	2-7/8	4-3/4
80	89	92	140
3	3-1/2	3-5/8	5-1/2
100	114	118	165
4	4-1/2	4-5/8	6-1/2

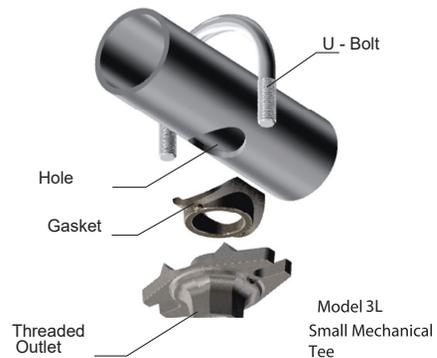
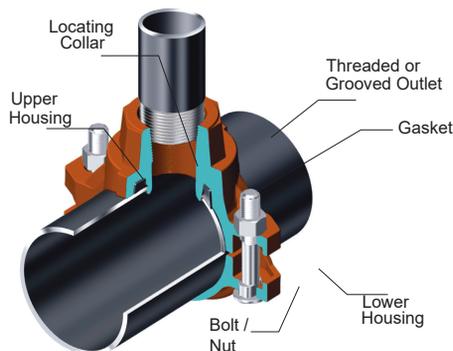
*See Table 1-b for exception.



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

Table 2

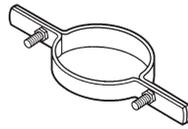
Model 3L Saddle-Let			
Mechanical Tee Branch Size	Hole Dimensions		Surface Preparation "A"
	Hole Saw Size	Max Dia. Allowed	
15, 20, 25	30	32	89
1/2, 3/4, 1	1-3/16	1-1/4	3-1/2



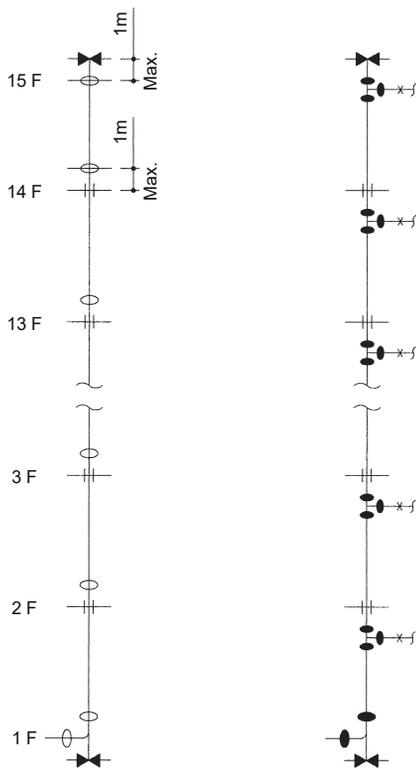
Supports for risers

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.



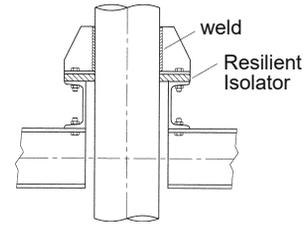
Riser clamp



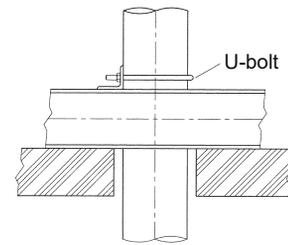
- Flexible Coupling
- Rigid Coupling
- ⊕ Anchor
- ⊕⊕ Sway brace

- 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.

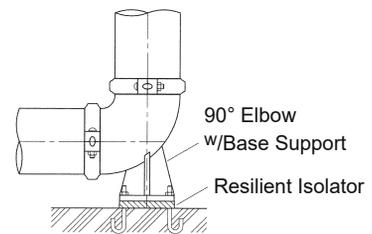
Anchors for risers (⊕)



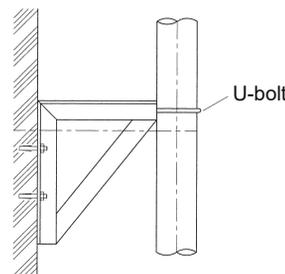
Sway braces for risers (⊕⊕)



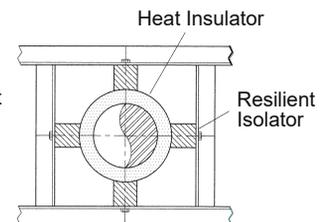
Anchor (⊕)



Sway brace (⊕⊕)

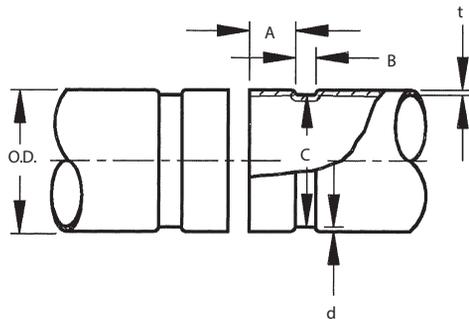


Sway brace (⊕⊕)



Wingrou is not responsible 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 Nominal Size mm/in	2 Pipe O.D.		3 A ±0.76 ±0.030	4 B ±0.76 ±0.030	5 C +0.00 +0.000	6 Min. Wall t mm/in	7 Groove Depth d (ref.) mm/in	8 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 3.834-0.020	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.

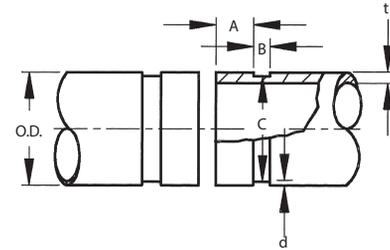
Groove Depth (Column 7):

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



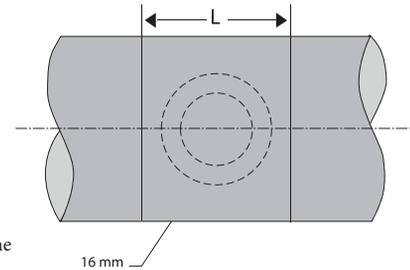
1 Nominal Size mm/in	2 Pipe O.D.		3 A ±0.79 ±0.031	4 B ±0.79 ±0.031	5 C +0.00 +0.000	6 Min. Wall t mm/in	7 Groove Depth d (ref.) mm/in	
	Basic mm/in	Tolerance						
20	26.7	+0.25	-0.25	15.88	7.95	23.83-0.38	2.87	1.42
0.75	1.050	+0.010	-0.010	0.625	0.313	0.938-0.015	0.113	0.056
25	33.4	+0.33	-0.33	15.88	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 performing a deviation, ensure that the hole produced meets the tolerance specifications and is correctly aligned on the centerline of the pipe. The surface in a length of L and within a 16 mm radius around the hole must be perfectly clean and smooth to ensure proper gasket seating. Never use a flame to drill the hole.



Wingrou Hole Cutting Machine
Model No. TWK-III A
Ref. page No. 54



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)

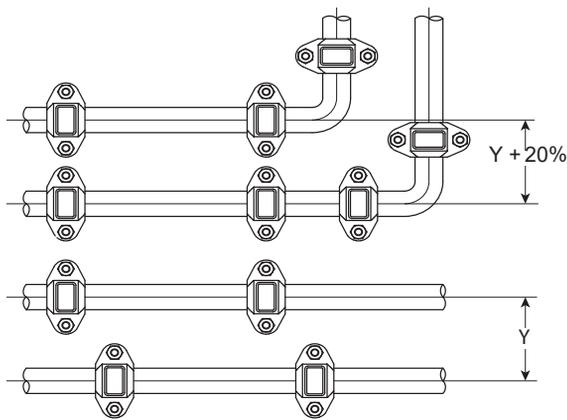
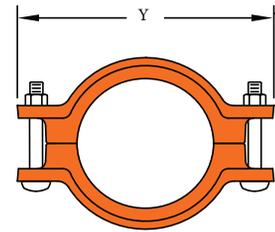
Main tube	Required branch	Hole to execute		Length L (mm)
		Nominal diameter (mm - Inches)	Maximum diameter (mm - Inches)	
DN50 (2") (Φ ext = 60,3 mm)	DN15 (1/2" - 21,3 mm)	38.0-1.50	39.6-1.16	89
	DN.20 (3/4" - 26,9 MM)	38.0-1.50	39.6-1.16	89
	DN25 (1" - 33,4 mm)	38.0-1.50	39.6-1.16	89
	DN32 (1 1/4" - 42,4 mm)	44.5-1.75	46.6-1.83	102
	DN40 (1 1/2" - 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	39.6-1.16	89
	DN20 (3/4" - 26,9 MM)	38.0-1.50	39.6-1.16	89
	DN25 (1" - 33,4 mm)	38.0-1.50	39.6-1.16	89
	DN32 (1 1/4" - 42,4 mm)	51.0-2.00	52.6-2.07	102
DN80 (3") (Φ ext = 88,9 mm)	DN40 (1 1/2" - 48,3 MM)	51.0-2.00	52.6-2.07	102
	DN15 (1/2" - 21,3 mm)	38.0-1.50	39.6-1.16	89
	DN20 (3/4" - 26,9 MM)	38.0-1.50	39.6-1.16	89
	DN25 (1" - 33,4 mm)	38.0-1.50	39.6-1.16	89
DN100 (4") (Φ ext = 114,3 mm)	DN32 (1 1/4" - 42,4 mm)	51.0-2.00	52.6-2.07	102
	DN40 (1 1/2" - 48,3 MM)	51.0-2.00	52.6-2.07	102
	DN50 (2" - 60,3 mm)	64.0-2.50	61.6-2.18	114
	DN65 (2 1/2" - 76,1mm)	70.0-2.75	71.6-2.82	120
	DN80 (3" - 88,9 MM)	89.0-3.50	90.6-3.17	140
DN125 (5") (Φ ext = 139,7 mm)	DN32 (1 1/4" - 42,4 mm)	51.0-2.00	52.6-2.07	102
	DN40 (1 1/2" - 48,3 MM)	51.0-2.00	52.6-2.07	102
	DN50 (2" - 60,3 mm)	64.0-2.50	61.6-2.18	114
	DN65 (2 1/2" - 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	61.6-2.18	114
	DN65 (2 1/2" - 76,1mm)	70.0-2.75	71.6-2.82	120
	DN32 (1 1/4" - 42,4 mm)	51.0-2.00	52.6-2.07	102
DN150 (6") (Φ ext = 168,3 mm)	DN40 (1 1/2" - 48,3 MM)	51.0-2.00	52.6-2.07	102
	DN50 (2" - 60,3 mm)	64.0-2.50	61.6-2.18	114
	DN65 (2 1/2" - 76,1mm)	70.0-2.75	71.6-2.82	120
	DN80 (3" - 88,9 MM)	89.0-3.50	90.6-3.17	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	61.6-2.18	114

SPACING REQUIREMENTS FOR GROOVED PIPING SYSTEMS

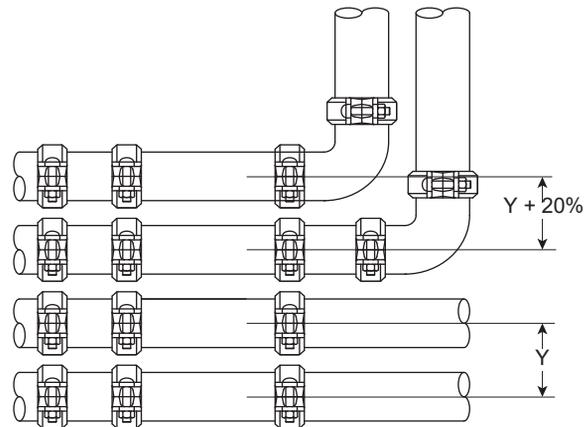
Since the grooved piping method incorporates externally mounted housings, consideration must be given to external dimensions beyond the pipe OD.

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

Recommended Minimum pipe Spacing



Example with Bolt Pads Facing Out

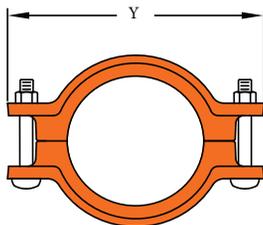


Example with Bolt Pads Facing In

Illustrations are exaggerated for clarity

To facilitate easy installation, insulation, and maintenance, proper spacing between pipelines must be considered. Wingrou grooved pipe couplings are externally mounted housings with bolt pads, so sufficient access space must be provided to tighten the bolts. Additionally, ensure there is enough space to prevent interference between the piping and adjacent couplings.

For systems where couplings are staggered, the pipe centerline must be spaced by the width of the coupling housings (the “Y” dimension). When couplings are aligned inline, add an additional 20% to the width (Y) to ensure proper spacing, as illustrated above.



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

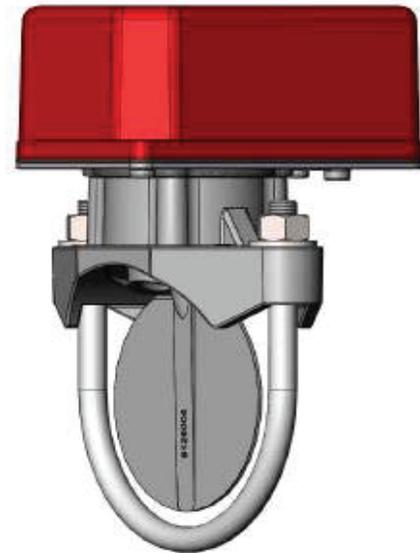
External Clearance Allowance

When installing grooved piping systems in confined areas—such as a pipe shaft, tunnel, 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 should be slightly greater than the “Y” dimension at the widest point of the coupling. The required clearance may vary depending on installation procedures, the proximity of other pipes, and other factors.

Engineering Specifications

The Wingrou water flow indicators should be installed on system piping as designated on the drawings and/or as specified herein. They can be mounted on any clear pipe span of the appropriate normal size, whether the pipe is horizontal or vertical. The indicators are designed to detect water flow with a sensitivity range of 4-10 gallons per minute and have a static pressure rating of up to 450 psi for 2" to 8" (50 mm to 200 mm) pipes. The indicators will respond to water flow in the specified direction after a preset time delay, which is field-adjustable. The delay mechanism will be a sealed mechanical pneumatic unit with a visual time delay adjustment.

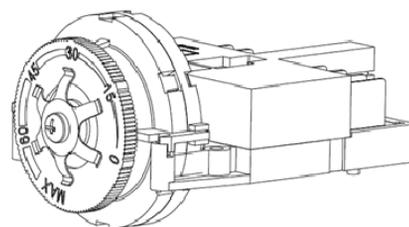
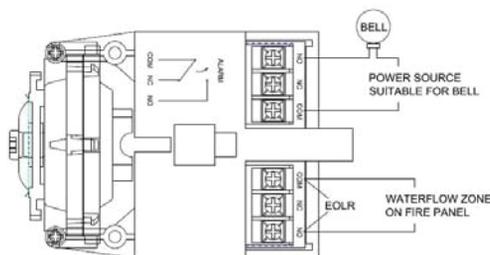
Note: Cover material is Aluminum, alternative Plastic Cover.



Features and Specifications

Working Pressure	Max3.1Mpa (450psi)		
Sensitivity	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	Standards	GB5135.7-2018 & FM1042-2016&UL346

Typical Electrical Connections and Time Delay Adjustment

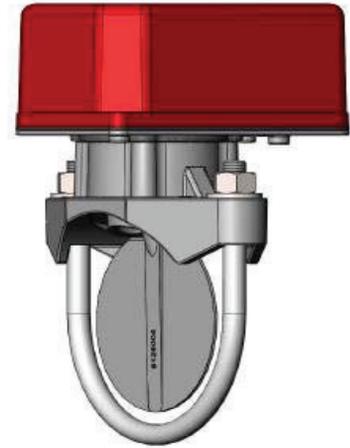
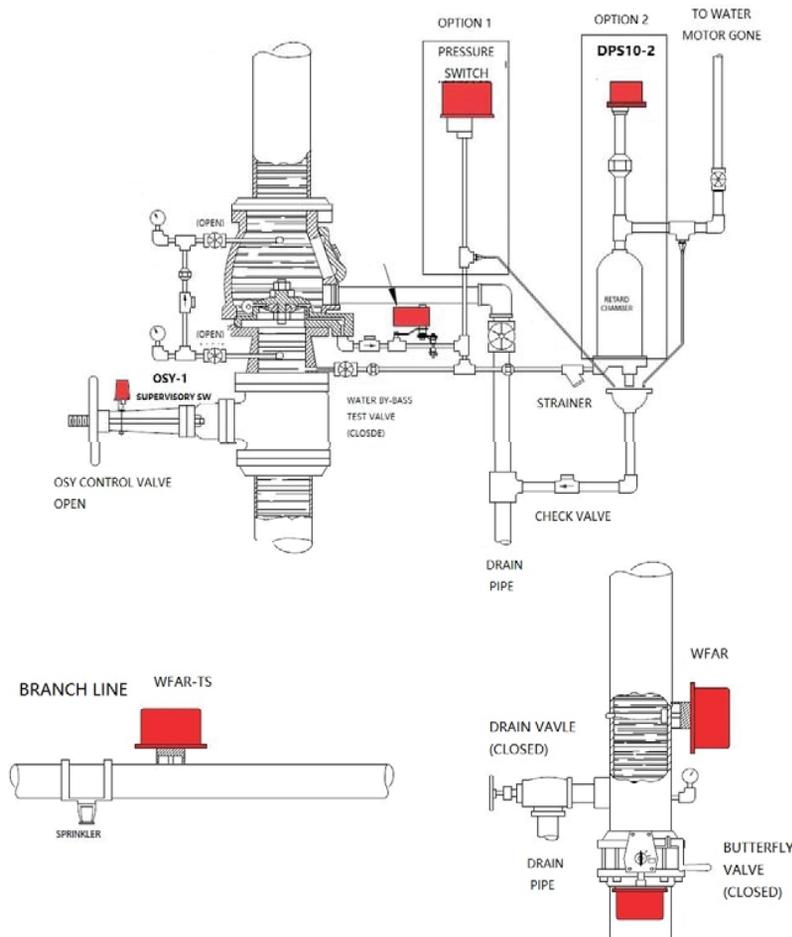


Retard Structure can be set from "0" to "MAX" position, delay time can be set from 0~90secs

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 (Φ ext = 219.1 mm)	Vane-Type Water flow indicator	200mm (8")	50.8mm(2")

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.

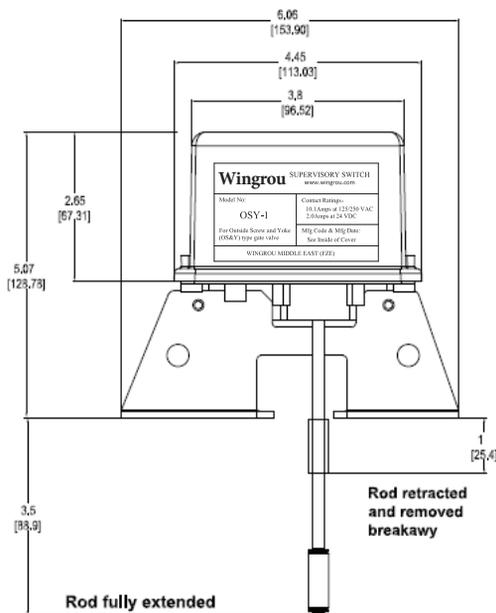
Note: Cover material is Aluminium, alternative Plastic Cover.



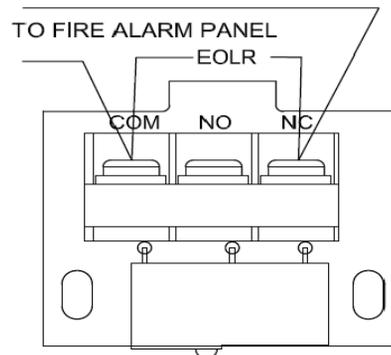
Electrical Specifications

Enclosure Rating	NEMA 4- suitable for indoor/outdoor	Operating Temperature:	32° F to 140°F (0°C to 60°C)
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 @ 24 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 Profile

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

Pipe Preparation Tools

Field Fabrication

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 - 2 1/2" 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 measuring tape	29	1
	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 for ideal 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

Sturdy hydraulic pump with precisely formed grips

For ideal handling

Powerful yet quiet motor

Fine adjustment of the groove depth and regulation

Pressure valve

Quick application modifications

Stabilizer for large pipes

No slipping of the pipe

Compact and very stable



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-III A 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-III A
- 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 114mm on 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 |



WINGROU TWK-VA HOLE CUTTING MACHINE

Pipe Preparation Tools
Field Fabrication

Product Description

FEATURES

- Hole cutting machine TWK-VA is designed for drilling holes on plastic pipe, plastic-lining steel pipes and steel pipes. The max diameter of steel pipe is 8 inch and the max hole is 4 inches.
- Simple detachable design, especially suitable for working on the corners of the job site.
- Gradienter attached, pointer can indicate the drilling position which will be very efficient.
- If the drilling holes under 38mm diameter, pls select the small center drill to install the corresponding hole saws.
- The standard equipped tightening chain can only fix the tube diameter up to 8 inches. Customers can add one piece of tightening chain to fix the tube diameter up to 10 inches.

Technical Data

• Code:	H-TWK-VA
• Capacity:	DN25 –DN100
• Max. Hole Diameter:	Holes 114mm
• Max. Wall Thickness:	10mm
• Output RPM:	200-470 RPM
• Gross Weight:	17kg
• Packaging Size:	600x2000x480mm
•	
•	Model # TWK-VA



WINGROU TWT-1T50B THREADING MACHINE

Pipe Preparation Tools
Field Fabrication

Capacity

- Pipe range: 1/2" - 2"

Features

- This machine is designed for 1/2"-2" threading, cutting, reaming
- Equipped with PMSM, high power but low noise
- High and low speeds for more convenient operation
- Manual die heads and self opening die heads are available for selection
- HSS dies, long life, more durable



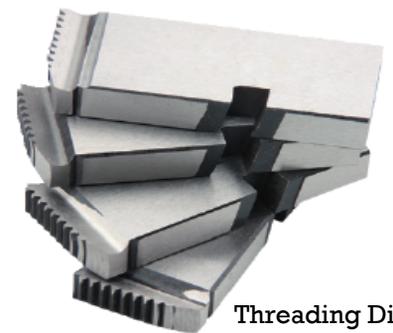
TWT-1T 50B

Standard Equipment

Art.No	Description	
04.08.016	Cutter	(2)
04.08.019	Reamer	(3)
03.04.02.202	BSPT dies 1/2-3/4"	(1)
03.04.02.203	BSPT dies 1-2"	(1)

Optional Equipment

Art.No	Description
03.04.02.200	NPT dies 1/2-3/4"
03.04.02.201	NPT dies 1-2"



Threading Dies

Model No.	TWT-1T50B
Type of Head	Self Open
Ability	1/2 - 2"
Voltage	110 -220 volts (50/60 Hz)
Powerful Motor	1800 watts
Speed of the Machine	Fast 40 rpm slow 20 rpm
Weight	77 Kgs
Machine Box Dimension	860 x 550 x 650 mm



(3)



(2)



Wheel Stand (optional)

Model No	Description	Spindle Speed	Pipe Threading Capacity mm	G. Weight
	1/2" - 2"	Slow 9 rpm		
TWT-1T50B	220V 50/60Hz	Quick 26 rpm	15-50	94 Kg

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 whether on buyer's purchase order or otherwise shall be valid unless the waiver, alteration or modification is specifically 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 expense (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 FITNESS 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 misuse, 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, incidental 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 all 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 writing within ten(10) days of receipt of shipment. Claim for products damaged or lost in transit should be made on the carrier, seller's responsibility ceases, and title passes 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 nut 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 and push the gasket over one of the grooved ends of the two pipes to be joined. Gasket lip should not overhang pipe end.
4. Align and bring the pipes end together and slide gasket into position entered between the grooves on each pipe. Gasket 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 tongue 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. Steel 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 interior 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 affect 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 halves.
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 are 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. Torque 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 hinge hole opposite the lock bolt and direct the two bolt assembly to mate with the flange of the device to be joined.
6. Add the 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 responsible for the design of piping systems and accepts no liability for systems that are not properly designed.

FIRE PROTECTION VALVES



DIN F4 Resilient seated NRS gate valve-flange end

Name of parts	Material
Body	Ductile iron
Wedg	Ductile iron+EPDM
Stem nut	Bronze
Stem	SS431 or SS304, SS316, bronze
Bonnet	Ductile iron
Bonnet Gasket	EPDM
Sealing Ring	EPDM
Upper cover	Ductile iron
Sliding disc	Bronze
Screw	Carbon steel with hot galvanization
O-rings	EPDM
Handwheel	Ductile iron

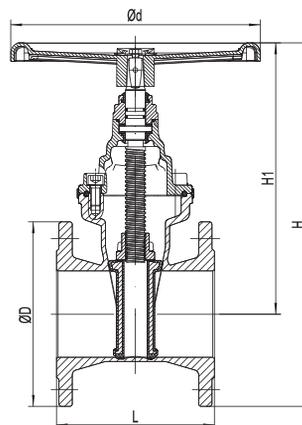


Model No. Z45X-01



Technical data >

- Sizes: DN50~DN300
- Working pressure: PN16/PN25
- Valve standard: EN1171
- Flange standard: EN1092-2
- Temperature range: 0 ~ 80 °C



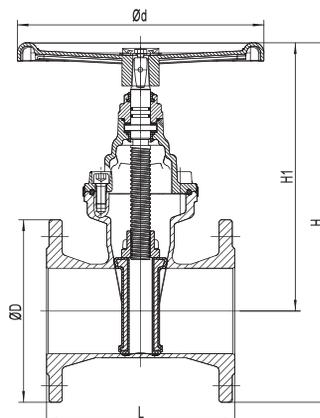
Dimensions		Pressure rating	Size (mm)				
DN	inch		PN	ΦD	L	H1	H
50	2	16	165	150	256	338.5	203
		25					
65	2.5	16	185	170	256	348.5	203
		25					
80	3	16	200	180	273.5	373.5	203
		25					
100	4	16	220	190	323.5	433.5	300
		25	235			441	
125	5	16	250	200	376	501	300
		25	270			511	
150	6	16	285	210	423.5	566	300
		25	300			573.5	
200	8	16	340	230	530.5	700.5	406
		25	360			710.5	
250	10	16	400	250	645	845	406
		25	425			857.5	
300	12	16	455	270	725.5	953	406
		25	485			953	

BS5163 Resilient seated NRS gate valve-flange end

Model No. Z45X-02



Name of parts	Material
Body	Ductile iron
Wedg	Ductile iron+EPDM
Stem nut	Bronze
Stem	SS431 or SS304, SS316, bronze
Bonnet	Ductile iron
Bonnet Gasket	EPDM
Sealing Ring	EPDM
Upper cover	Ductile iron
Sliding disc	Bronze
Screw	Carbon steel with hot galvanization
O-rings	EPDM
Handwheel	Ductile iron



Technical data >

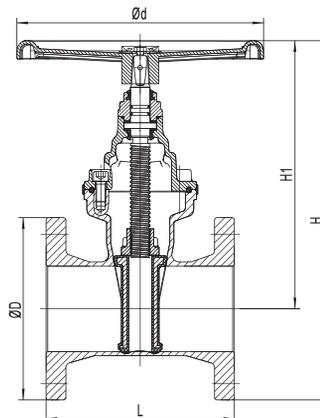
- Sizes: DN50~DN300
- Working pressure: PN16/PN25
- Valve standard: BS5163
- Flange standard: EN1092-2
- Temperature range: 0 ~ 80 C

Dimensions		Pressure rating	Size (mm)				
DN	inch		PN	ΦD	L	H1	H
50	2	16	165	178	256	338.5	203
		25		216			
65	2.5	16	185	190	256	348.5	203
		25		241			
80	3	16	200	203	273.5	373.5	203
		25		283			
100	4	16	220	229	323.5	433.5	300
		25	235	305		441	
125	5	16	250	254	376	501	300
		25	270	381		511	
150	6	16	285	267	423.5	566	300
		25	300	403		573.5	
200	8	16	340	292	530.5	700.5	406
		25	360	419		710.5	
250	10	16	400	330	645	845	406
		25	425	457		857.5	
300	12	16	455	356	725.5	953	406
		25	485	502		953	

AWWA C515 Resilient seated NRS gate valve-flange end

Model No. Z45X-03

Name of parts	Material
Body	Ductile iron
Wedg	Ductile iron+EPDM
Stem nut	Bronze
Stem	SS431 or SS304,SS316,bronze
Bonnet	Ductile iron
Bonnet Gasket	EPDM
Sealing Ring	EPDM
Upper cover	Ductile iron
Sliding disc	Bronze
Screw	Carbon steel with hot galvanization
O-rings	EPDM
Handwheel	Ductile iron



Technical data >

- Sizes: 2" ~ 12"
- Working pressure: 175PSI, 300PSI
- Valve standard: AWWA C515
- Flange standard: ASME-B16.1 Class125
- Temperature range: 0 ~ 80 °C

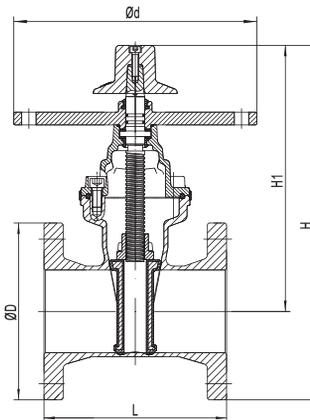
Dimensions		Pressure rating	Size (mm)				
DN	inch	psi	ΦD	L	H1	H	Φd
50	2	175	152	178	256	332	203
		300					
65	2.5	175	178	190	256	345	203
		300					
80	3	175	191	203	273.5	369	203
		300					
100	4	175	229	229	323.5	438	300
		300					
125	5	175	254	254	376	503	300
		300					
150	6	175	279	267	423.5	563	300
		300					
200	8	175	343	292	530.5	702	406
		300					
250	10	175	406	330	645	848	406
		300					
300	12	175	483	356	725.5	967	406
		300					

AWWA C515 Resilient seated NRS gate valve-flange end with indicator post flange

Model No. Z45X-04



Name of parts	Material
Body	Ductile iron
Wedg	Ductile iron+EPDM
Stem Nut	Bronze
Stem	SS431 or SS304,SS316,bronze
Bonnet	Ductile iron
Bonnet Gasket	EPDM
Sealing Ring	EPDM
Indicator Post Flange	Ductile iron
Sliding disc	Bronze
Screw	Carbon steel with hot galvanization
O-rings	EPDM
Wrench Nut	Ductile iron



Technical data >

- Sizes: 2" ~ 12"
- Working pressure: 175PSI, 300PSI
- Valve standard: AWWA C515
- Flange standard: ASME-B16.1 Class125
- Temperature range: 0 ~ 80 °C

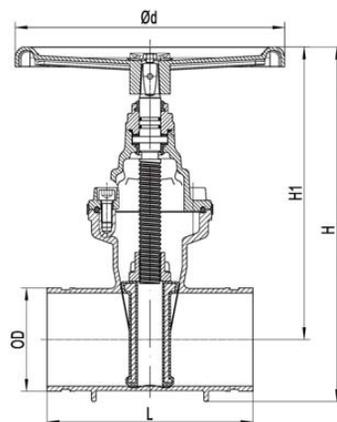
Dimensions		Pressure rating	Size (mm)				
DN	inch	psi	ΦD	L	H1	H	Φd
100	4	175	229	229	332.5	449	305
		300					
125	5	175	254	254	385	512	305
		300					
150	6	175	279	267	432.5	572	305
		300					
200	8	175	343	292	527	698.5	305
		300					
250	10	175	406	330	645	848	305
		300					
300	12	175	483	356	722	963.5	305
		300					

Resilient seated NRS gate valve grooved end

Name of parts	Material
Body	Ductile iron
Wedg	Ductile iron+EPDM
Stem nut	Bronze
Stem	SS431 or SS304, SS316, bronze
Bonnet	Ductile iron
Bonnet Gasket	EPDM
Sealing Ring	EPDM
Upper cover	Ductile iron
Sliding disc	Bronze
Screw	Carbon steel with hot galvanization
O-rings	EPDM
Handwheel	Ductile iron



Model No. Z85X -03



Technical data >

- Sizes: DN50/60~DN200/219
- Working pressure: PN25, 362PSI
- Valve standard: AWWA C515
- Grooved standard: AWWA C606
- Temperature range: 0 ~ 80 C

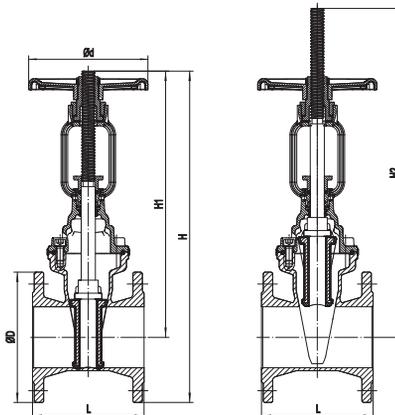
Dimensions		Pressure rating	Size (mm)				
DN	inch		psi	ΦD	L	H1	H
50	2	362	60.3	178	256	301	203
65	2.5		73				
			76.1	190	256	307.5	203
80	3	362	88.9	203	273.5	333	203
100	4	362	114.3	229	323.5	396	300
125	5	362	139.7	254	376	461	300
			141.3				
150	6	362	165.1	267	423.5	521	300
			168.3				
200	8	362	219.1	292	530.5	660	406

DIN F4 Resilient seated OS&Y gate valve-flange end

Model No. Z41X-01



Name of parts	Material
Body	Ductile iron
Wedge	Ductile iron+EPDM
Stem nut	Bronze
Stem	SS431 or SS304, SS316, bronze
Bonnet	Ductile iron
Bonnet Gasket	EPDM
Sealing Ring	EPDM
Yoke	Ductile iron
Sliding disc	Bronze
Screw	Carbon steel with hot galvanization
O-rings	EPDM
Handwheel	Ductile iron



Technical data >

- Sizes: DN50~DN300
- Working pressure: PN16/PN25
- Valve standard: EN1171
- Flange standard: EN1092-2
- Temperature range: 0 ~ 80 °C

Dimensions		Pressure rating	Size (mm)					
DN	inch		PN	ΦD	L	H1	H2	H
50	2	16	165	150	358.5	420.5	441	203
		25						
65	2.5	16	185	170	359.5	429.5	452	203
		25						
80	3	16	200	180	378	462	478	203
		25						
100	4	16	220	190	449.5	553	559.5	203
		25	235				567	
125	5	16	250	200	549.5	677	674.5	300
		25	270				684.5	
150	6	16	285	210	591.5	747	734	300
		25	300				741.5	
200	8	16	340	230	735.5	938	905.5	330
		25	360				915.5	
250	10	16	400	250	900.5	1161	1100.5	406
		25	425				1113	
300	12	16	455	270	1045.5	1353	1273	406
		25	485				1288	

BS5163 Resilient seated OS&Y gate valve-flange end

Name of parts	Material
Body	Ductile iron
Wedge	Ductile iron+EPDM
Stem nut	Bronze
Stem	SS431 or SS304, SS316, bronze
Bonnet	Ductile iron
Bonnet Gasket	EPDM
Sealing Ring	EPDM
Yoke	Ductile iron
Sliding disc	Bronze
Screw	Carbon steel with hot galvanization
O-rings	EPDM
Handwheel	Ductile iron

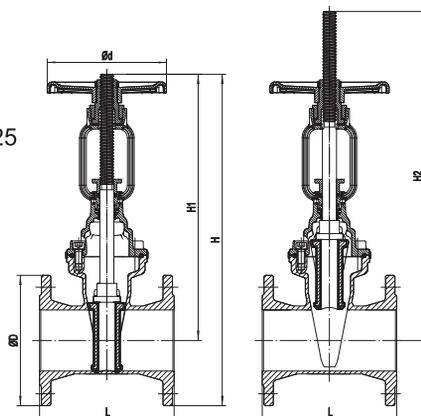


Model No. Z41X-02



Technical data >

- Sizes: DN50~DN300
- Working pressure: PN16/PN25
- Valve standard: BS5163
- Flange standard: EN1092-2
- Temperature range: 0 ~ 80 °C



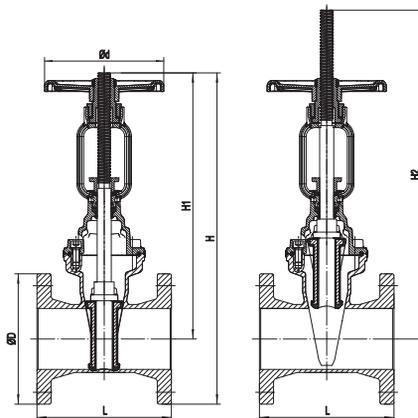
Dimensions		Pressure rating PN	Size (mm)																																																																																												
DN	inch		ΦD	L	H1	H2	H	Φd																																																																																							
50	2	16	165	178	358.5	420.5	441	203																																																																																							
		25		216					65	2.5	16	185	190	359.5	429.5	452	203	25	241	80	3	16	200	203	378	462	478	203	25	283	100	4	16	220	229	449.5	553	559.5	203	25	305	567	125	5	16	250	254	549.5	677	674.5	300	25	381	684.5	150	6	16	285	267	591.5	747	734	300	25	403	741.5	200	8	16	340	292	735.5	938	905.5	330	25	419	915.5	250	10	16	400	330	900.5	1161	1100.5	406	25	457	1113	300	12	16	455	356
65	2.5	16	185	190	359.5	429.5	452	203																																																																																							
		25		241					80	3	16	200	203	378	462	478	203	25	283	100	4	16	220	229	449.5	553	559.5	203	25	305	567	125	5	16	250	254	549.5	677	674.5	300	25	381	684.5	150	6	16	285	267	591.5	747	734	300	25	403	741.5	200	8	16	340	292	735.5	938	905.5	330	25	419	915.5	250	10	16	400	330	900.5	1161	1100.5	406	25	457	1113	300	12	16	455	356	1045.5	1353	1273	406	25	502	1288				
80	3	16	200	203	378	462	478	203																																																																																							
		25		283					100	4	16	220	229	449.5	553	559.5	203	25	305	567	125	5	16	250	254	549.5	677	674.5	300	25	381	684.5	150	6	16	285	267	591.5	747	734	300	25	403	741.5	200	8	16	340	292	735.5	938	905.5	330	25	419	915.5	250	10	16	400	330	900.5	1161	1100.5	406	25	457	1113	300	12	16	455	356	1045.5	1353	1273	406	25	502	1288															
100	4	16	220	229	449.5	553	559.5	203																																																																																							
		25		305			567		125	5	16	250	254	549.5	677	674.5	300	25	381	684.5	150	6	16	285	267	591.5	747	734	300	25	403	741.5	200	8	16	340	292	735.5	938	905.5	330	25	419	915.5	250	10	16	400	330	900.5	1161	1100.5	406	25	457	1113	300	12	16	455	356	1045.5	1353	1273	406	25	502	1288																											
125	5	16	250	254	549.5	677	674.5	300																																																																																							
		25		381			684.5		150	6	16	285	267	591.5	747	734	300	25	403	741.5	200	8	16	340	292	735.5	938	905.5	330	25	419	915.5	250	10	16	400	330	900.5	1161	1100.5	406	25	457	1113	300	12	16	455	356	1045.5	1353	1273	406	25	502	1288																																							
150	6	16	285	267	591.5	747	734	300																																																																																							
		25		403			741.5		200	8	16	340	292	735.5	938	905.5	330	25	419	915.5	250	10	16	400	330	900.5	1161	1100.5	406	25	457	1113	300	12	16	455	356	1045.5	1353	1273	406	25	502	1288																																																			
200	8	16	340	292	735.5	938	905.5	330																																																																																							
		25		419			915.5		250	10	16	400	330	900.5	1161	1100.5	406	25	457	1113	300	12	16	455	356	1045.5	1353	1273	406	25	502	1288																																																															
250	10	16	400	330	900.5	1161	1100.5	406																																																																																							
		25		457			1113		300	12	16	455	356	1045.5	1353	1273	406	25	502	1288																																																																											
300	12	16	455	356	1045.5	1353	1273	406																																																																																							
		25		502			1288																																																																																								

BS5163 Resilient seated OS&Y gate valve-flange end

Model No. Z41X-03



Name of parts	Material
Body	Ductile iron
Wedge	Ductile iron+EPDM
Stem nut	Bronze
Stem	SS431 or SS304, SS316, bronze
Bonnet	Ductile iron
Bonnet Gasket	EPDM
Sealing Ring	EPDM
Yoke	Ductile iron
Sliding disc	Bronze
Screw	Carbon steel with hot galvanization
O-rings	EPDM
Handwheel	Ductile iron



Technical data >

- Sizes: 2" ~ 12"
- Working pressure: 175PSI, 300PSI
- Valve standard: BS5163
- Flange standard: EN1092-2
- Temperature range: 0 ~ 80 C

Dimensions		Pressure rating	Size (mm)					
DN	inch	psi	ΦD	L	H1	H2	H	Φd
50	2	175		178	358.5	420.5	300	203
		300						
65	2.5	175		190	359.5	429.5	320	203
		300						
80	3	175		203	378	462	380	203
		300						
100	4	175		229	449.5	553	415	203
		300						
125	5	175		254	549.5	677	540	300
		300						
150	6	175		267	591.5	747	590	300
		300						
200	8	175	343	292	735.5	938	907	330
		300						
250	10	175	406	330	900.5	1161	1103.5	406
		300						
300	12	175	483	356	1045.5	1353	1287	406
		300						

Resilient seated OS&Y gate valve-grooved end

Name of parts	Material
Body	Ductile iron
Wedge	Ductile iron+EPDM
Stem nut	Bronze
Stem	SS431 or SS304, SS316, bronze
Bonnet	Ductile iron
Bonnet Gasket	EPDM
Sealing Ring	EPDM
Yoke	Ductile iron
Sliding disc	Bronze
Screw	Carbon steel with hot galvanization
O-rings	EPDM
Handwheel	Ductile iron

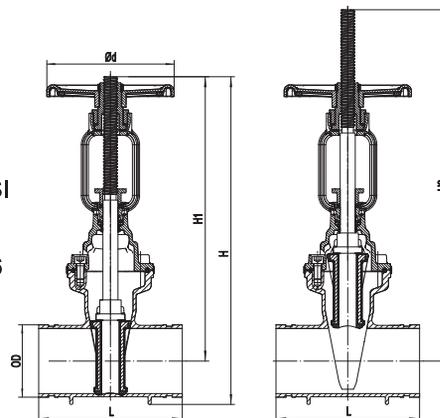


Model No. Z81X



Technical data >

- Sizes: DN50/60~DN200/219
- Working pressure: PN25, 362PSI
- Valve standard: AWWA C515
- Grooved standard: AWWA C606
- Temperature range: 0 ~ 80 C



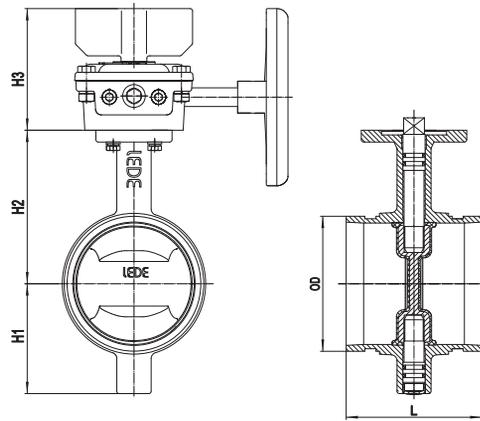
Dimensions		Pressure rating	Size (mm)					
DN	inch		psi	OD	L	H1	H2	H
50	2	362	60.3	178	358.5	420.5	403.5	203
65	2.5	362	73	190	359.5	429.5	411	203
			76.1					
80	3	362	88.9	203	378	462	437.5	203
100	4	362	114.3	229	449.5	553	518.5	203
125	5	362	139.7	254	549.5	677	631	300
			141.3					
150	6	362	165.1	267	591.5	747	686	300
			168.3					
200	8	362	219.1	292	735.5	938	865	330

Butterfly valve with tamper switch grooved end

Model No. XD381X



Name of parts	Material
Body	Ductile iron
Plug	EPDM
Driven shaft	1Cr17Ni2
Disc	Ductile iron and EPDM
Actuating shaft	1Cr17Ni2
Bearing bush	Bronze
O-rings	EPDM
Gear operator	Ductile iron and steel



Technical data >

- Sizes: 60.3~219.1
- Working pressure: 60.3~168.3 362 psi, 219.1 232psi
- Valve standard: MSS SP-67
- Grooved standard: AWWA C606
- Top Flange standard: EN ISO 5211
- Temperature range: 0 ~ 80 °C
- Suitable for indoor and outdoor use

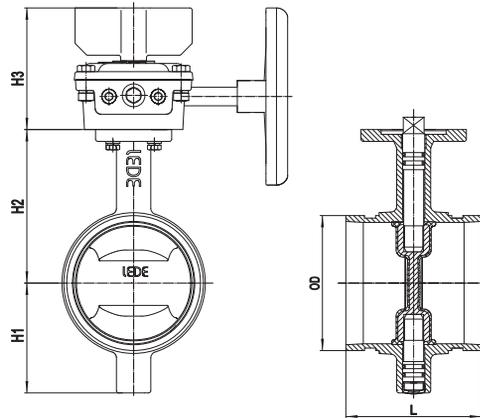
Dimensions		Pressure rating	Size (mm)					
DN	inch		OD	L	H1	H2	H3	Top Flange
50	2	362	60.3	81	56	91	103	F05
65	2.5	362	73	96.8	68	104	103	F05
			76.1					
80	3	362	88.9	96.8	75	111	103	F07
100	4	362	114.3	115.8	93	130	103	F07
125	5	362	139.7	147.6	111	153	103	F07
			141.3		111	153		
150	6	362	165.1	147.6	123	165	103	F07
			168.3		123	165		
200	8	362	219.1	133.4	160	194	109	F07

Butterfly valve grooved end

Model No. XD381X



Name of parts	Material
Body	Ductile iron
Plug	EPDM
Driven shaft	1Cr17Ni2
Disc	Ductile iron and EPDM
Actuating shaft	1Cr17Ni2
Bearing bush	Bronze
O-rings	EPDM
Gear operator	Ductile iron and steel



Technical data >

- Sizes: 60.3~219.1
- Working pressure: 60.3~168.3 362 psi, 219.1 232psi
- Valve standard: MSS SP-67
- Grooved standard: AWWA C606
- Top Flange standard: EN ISO 5211
- Temperature range: 0 ~ 80 °C
- Suitable for indoor and outdoor use

Dimensions		Pressure rating	Size (mm)					
DN	inch		psi	OD	L	H1	H2	H3
50	2	362	60.3	81	56	91	103	F05
65	2.5	362	73	96.8	68	104	103	F05
			76.1					
80	3	362	88.9	96.8	75	111	103	F07
100	4	362	114.3	115.8	93	130	103	F07
125	5	362	139.7	147.6	111	153	103	F07
			141.3		111	153		
150	6	362	165.1	147.6	123	165	103	F07
			168.3		123	165		
200	8	362	219.1	133.4	160	194	109	F07

Swing check valve with flange end

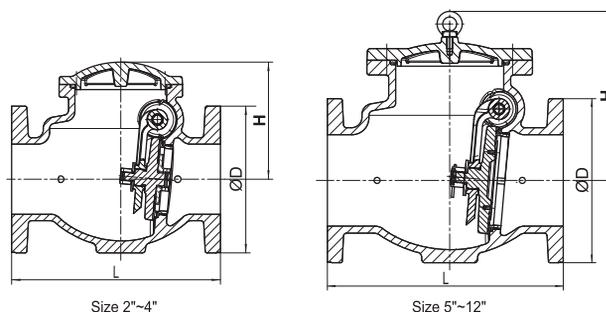
Model No. H44X



Name of parts	Material
Body	Ductile iron
Seat Ring	Bronze
Disc Sealing Ring	EPDM
Disc Plate	SS304
Disc	Ductile iron
Clapper Arm	Ductile iron
Bonnet Gasket	EPDM
Bonnet	Ductile iron
Hinge Pin	SS304
Hinge Bushing	Bronze
Hinge Plug	SS304

Technical data >

- Sizes: 2"~12"
- Working pressure: 300psi
- Valve standard: AWWA C508
- Flange standard: ASME-B16.1 Class125
- Temperature range: 0 ~ 80 °C



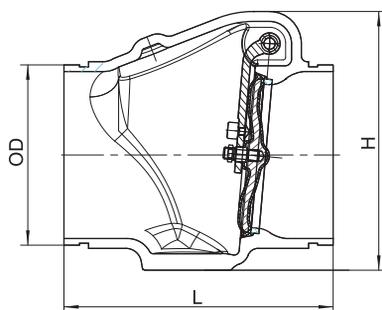
Dimensions		Pressure rating	Size (mm)		
DN	inch		psi	ΦD	L
50	2	300	152	203	125
65	2.5	300	178	254	139
80	3	300	191	279	153
100	4	300	229	330	184
125	5	300	254	356	275
150	6	300	279	406	289
200	8	300	343	495	352
250	10	300	406	559	411
300	12	300	483	660	480

Swing check valve with grooved end

Name of parts	Material
Body	Ductile iron
Seat Ring	Bronze
Disc Sealing Ring	EPDM
Disc Plate	SS304
Disc	Ductile iron
Clapper Arm	Ductile iron
Bonnet Gasket	EPDM
Bonnet	Ductile iron
Hinge Pin	SS304
Hinge Bushing	Bronze
Hinge Plug	SS304



Model No. H84X



Technical data >

- Sizes: 2"~12"
- Working pressure: 362psi
- Grooved standard: AWWA C606
- Temperature range: 0 ~ 80 C

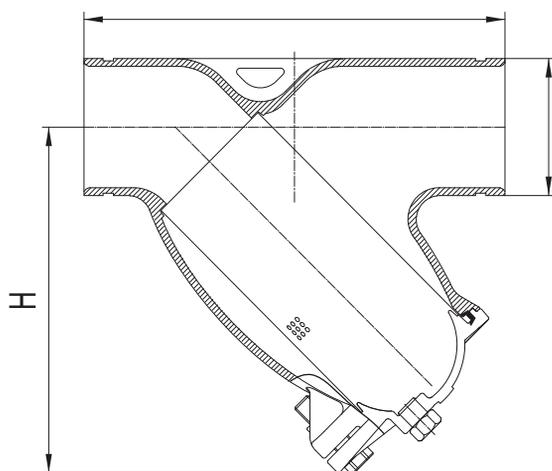
Dimensions		Pressure rating	Size (mm)		
DN	inch		psi	OD	L
50	2	362	60.3	167	122.5
65	2.5	362	73	180	136.5
			76.1		
80	3	362	88.9	198	165.5
100	4	362	114.3	229	193.6
125	5	362	139.7	254	235.5
			141.3		
150	6	362	165.1	272	252
			168.3		
200	8	362	219.1	330	314.5
250	10	362	273.1	435	395

Y strainer with grooved end

Name of parts	Material
Body	Ductile iron
Cover	Ductile iron
Gasket	EPDM
Screen	SS304
Plug	Bronze



Model No. 6102



Technical data >

- Sizes: 2"~8"
- Working pressure: 362psi
- Grooved standard: AWWA C606
- Temperature range: 0 ~ 80 °C

Dimensions		Pressure rating	Size (mm)		
DN	inch		psi	OD	L
50	2	362	60.3	230	154
65	2.5	362	73	290	201
			76.1		
80	3	362	88.9	310	210
100	4	362	114.3	350	269
125	5	362	139.7	400	320
			141.3		
150	6	362	165.1	480	357
			168.3		
200	8	362	219.1	550	442

Deluge Valve

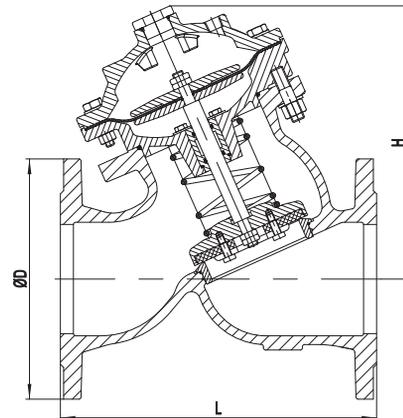
Model No. YL4X



Name of parts	Material
Body	Ductile iron
Seat Ring	SS304
Gland of Main Disc	SS304
Main Gasket	EPDM
Main Disc	SS304
Spring	SS420J2
Stem	SS304
Middle Bonnet	Ductile iron
Bushing	Bronze
Bottom Gland	SS304
Diaphragm	EPDM
Up Gland	SS304
Up Bonnet	Ductile iron
Cap Plug	SS304
Bolt	SS304

Technical data >

- Sizes: 2"~12"
- Working pressure: 300psi
- Flange standard: ASME-B16.1 Class125
- Temperature range: 0 ~ 80 C



Dimensions		Pressure rating	Size (mm)		
DN	inch		psi	ΦD	L
50	2	300	152	203	170
65	2.5	300	178	216	195
80	3	300	191	241	210
100	4	300	229	292	250
125	5	300	254	330	290
150	6	300	279	356	350
200	8	300	343	495	420
250	10	300	406	622	550
300	12	300	483	698	645

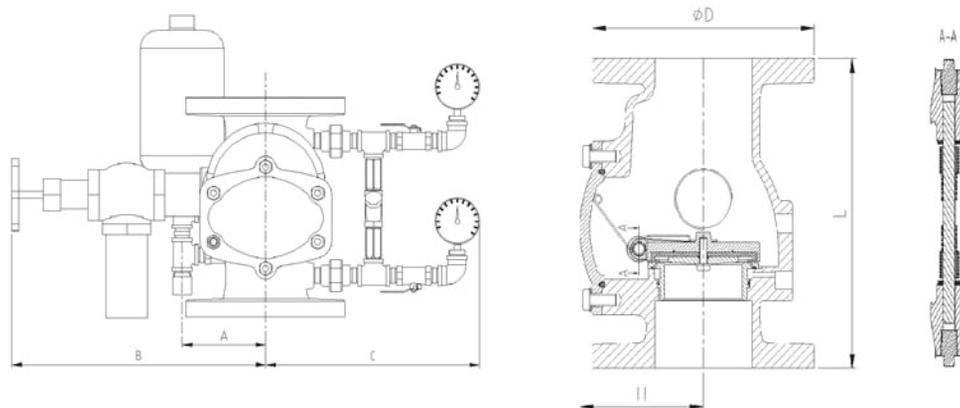
Alarm Check Valve



Name of parts	Material
Body	EN-GJS-500-7
Cover	EN-GJS-500-7
Disc	Bronze
Seat ring on body	Stainless Stell 304
Seal	EPDM
Shaft	Stainless Stell 304
Bearing bush	Brass
Spring	Stainless Stell 304

Specification >

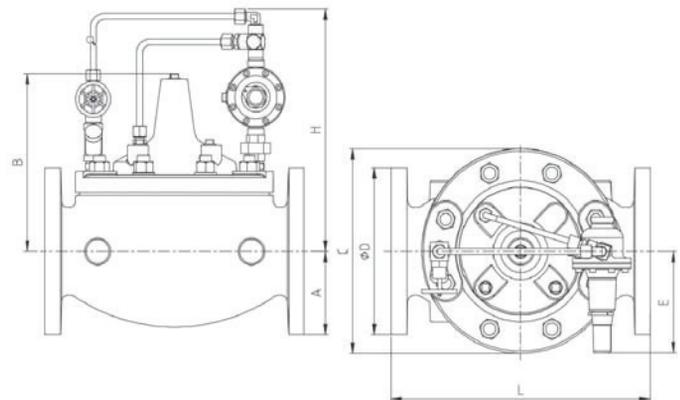
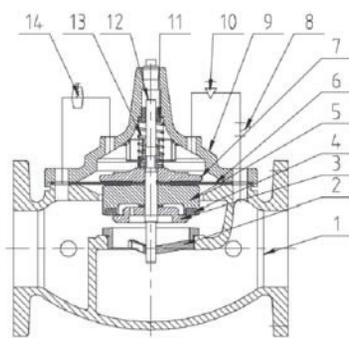
- Nominal diameter: 3"-8"
- Nominal pressurer: 300PSI
- Valve standard: UL193
- Face to face length: EN558-1 12 Series
- Flange type: ASME B16.1



Dimensions		Pressure rating	Size (mm)						
DN	inch		psi	ΦD	L	H	A	B	C
80	3	300	190	283	120	120	296	300	238
100	4	300	229	305	127.5	120	365	305	182
150	6	300	280	394	182	120	402	330	218
200	8	300	345	457	214	120	424	365	248

Pressure Reducing Valve

No.	Name of parts	Material
1	Body	Ductile Iron AS1831 500-7
2	valve seat	Stainless Steel 304
3	Valve plate	Stainless Steel 304
4	seal gasket	EPDM AS1646
5	valve disk	Ductile Iron AS1831 500-7
6	diaphragm	EPDM+Nylon
7	Diaphragm plate	Ductile Iron AS1831 500-7
8	Filter	Stainless Steel 304
9	Valve cover	Ductile Iron AS1831 500-7
10	Needle	Stainless Steel 304
11	Guiding plug	Stainless Steel 304
12	Valve shaft	Stainless Steel 304
13	Spring	Stainless Steel 304
14	Pilot-Relief valve	Stainless Steel 304



Dimensions		Pressure rating psi	Size (mm)						
DN	inch		ΦD	L	H	A	B	C	E
50	2	300	150	230	294	82.5	152	155	134
65	2-1/2	300	180	290	298	92.5	170	190	134
80	3	300	190	310	310	100	197	233	134
100	4	300	230	350	320	110	234	270	134
150	6	300	280	480	352	158	311	378	134
200	8	300	345	600	382	190	377	496	134

For more info, please contact us at:

Wingrou Pipe Technology Co.

The Beehive city place, Gatwick,
West Sussex, RH6 OPA, United Kingdom

web: www.wingrou.com

Email:- info@wingrou.co.uk
info@wingrou.com