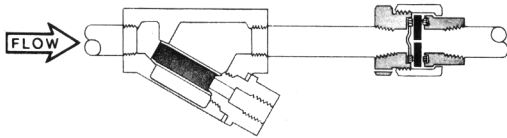


# TYPE DUA ORIFICE UNION & DUM-T DRAIN UNION ASSEMBLY

**Pressures To 3000 PSIG (207 barg)  
Temperatures to 850°F (454°C)**



## Applications

- Condensate Removal
- Pressure Reduction
- Ratio of Flow-mixing two or more fluids at fixed ratio
- Fixed Flow-i.e. gland seal recirculation of cooling water on pumps, compressors, process analyzers, etc.
- Intermittent Drainage-i.e. air tools, air storage tanks, cleaning fixtures, air vents, etc.
- Cryogenic Storage Venting
- Low Pressure Blanking
- Sampling of process fluids at a fixed flow rate for use with Instrument Analyzers

## Options

- B - Blowdown Valve (on DUM-T)
- SW - Socketweld (on DUA)

**Reliable Operation** — High reliability labyrinth-type seal: leak tight seal is maintained when subjected to expansion or contraction due to temperature or pressure changes in the line. Positive, leak-tight seal eliminates loss of product.

**Ease of Installation** — No danger of damaging seats or losing seal by overtightening during installation. Requires normal torque to obtain a leak-tight seal. Welding repairs reduced; no need to replace union components welded to pipe.

**Low Cost Maintenance** — Downtime, labor and material costs drastically reduced. Service is required only when the union is disassembled, then only a change of gaskets is required to put it back in service. Eliminates the need to replace the union housing.

**Flexibility** — Orifice easily replaced where a different orifice size is required for a specific application. Orifice can be re-drilled to a larger size, if necessary, eliminating need to replace the entire assembly. Infinite range of orifice sizes available from a minimum 0.020" diameter.

## Models

- **DUA**—Orifice Union
- **DUM-T**—Orifice Union Module consisting of Y strainer and connecting nipple.
- **RUA**—Orifice Kit includes 2 gaskets, orifice plate and inlet screen.
- **DUR**—Gasket Kit includes 2 gaskets and inlet screen.
- **SUG**—Gasket Kit includes 10 gaskets.

Canadian Registration # 0E0591.9

## Operation

The Nicholson Drain Orifice Trap is an engineered, continuous flow device. The controlling element in the Drain Orifice Assembly is a flat S.S. plate, 1/4" thick. Drain Orifices discharge air, condensate and all other non-condensable gases with minimal live steam loss. The fixed orifice size is calculated, for a given application, to discharge the condensate load at a maximum thermal efficiency. Approximately 10-25% of discharging hot condensate flashes to steam at the downstream side of the orifice, at a constant pressure drop. This flashing effect further restricts the flow of saturated steam. In actual conditions, a

minimum percentage of steam, by weight, is discharged with condensate, since the specific volume of steam is large compared to that of the condensate. The velocity through the orifice is highly turbulent. The initial calculated steam loss can be expected to remain relatively constant over the expected 10+ years trap life. The major factor for energy efficient performance is based on initial orifice sizing for the application. Properly sized, thermal efficiencies of 98%+ can be attained. The Drain Orifice Trap is ideally suited for use on high pressure steam (saturated or superheated) from 300 PSIG to 3000 PSIG with minimum steam loss, zero maintenance and long service life.

# TYPE DUA ORIFICE UNION & DUM-T DRAIN UNION ASSEMBLY

## Typical Specification

Orifice Union shall consist of 1/4" 304 stainless steel plate fixed inside a gasketed union housing. Seal shall be provided by spiral wound gaskets whose inlet shall be modified with a stainless steel dome mesh strainer fixed across the inside diameter. Orifice shall be sized for the application to a minimum of 0.020 inches.

## Maximum Operating Conditions

### DUA

PMO: Max. Operating Pressure see Chart

TMO: Max. Operating Temperature see Chart

### DUM-T

PMO: Max. Operating Pressure

Cast Steel Strainer 600 psig (41 barg)

Cast Iron Strainer 250 psig (17.2 barg)

TMO: Max. Operating Temperature

Cast Steel Strainer 700°F (371°C)

Cast Iron Strainer 425°F (218°C)

## Materials of Construction

Body: Forged Carbon Steel

Inlet Gasket: Spiral-wound S.S./Graphite w/S.S. 60 mesh dome strainer insert

Orifice Plate: 304 S.S., 1/4" thick

Outlet Gasket: Spiral-wound S.S./Graphite

### DUM-T only

Strainer Body: Cast Iron or Cast Steel

Nipple: Steel SCH 80

## Sizing

Consult Factory—required information:

Condensate Load \_\_\_\_\_

Inlet Pressure \_\_\_\_\_

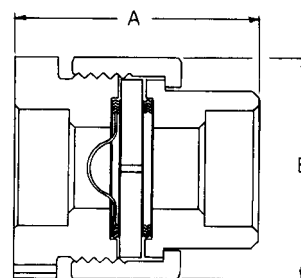
Outlet Pressure \_\_\_\_\_

Elevation of return line over trap (if any) \_\_\_\_\_

## Temperature/Pressure Ratings

Temperature* °F	Pressure (PSIG) Carbon Steel
100	3000
200	2735
300	2655
400	2565
500	2425
600	2220
700	2155

\*Minimum recommended temperature is -20°F.

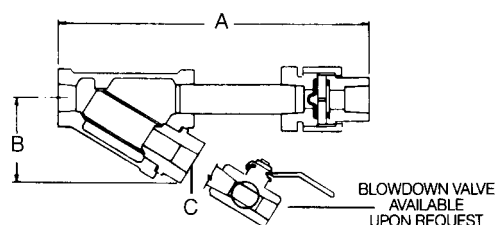


DUA

Connections: 1/2" – 1" NPT

Pipe Size NPT	Inches		Weight Lbs.*
	A	B	
1/2	2.42	1.8	1.2
3/4	2.73	2.20	1.8
1	2.94	2.57	2.6

\*Average weight—actual weights may vary slightly.



DUM-T

Connections: 1/2" – 1" NPT

Class	Pipe Size NPT	Inches			Weight Lbs.*
		A	B	C	
250 PSIG	1/2	9.00	2.19	3/8	3.2
	3/4	10.25	2.75	1/2	5.0
	1	11.12	3.25	3/4	7.8
600 PSIG	1/2	9.00	3.12	1/4	3.6
	3/4	9.88	3.63	3/8	5.8
	1	10.88	4.25	1/2	9.6

\*Average weight—actual weights may vary slightly.