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LNT INDUSTRIAL ENGINEERING SERVICES
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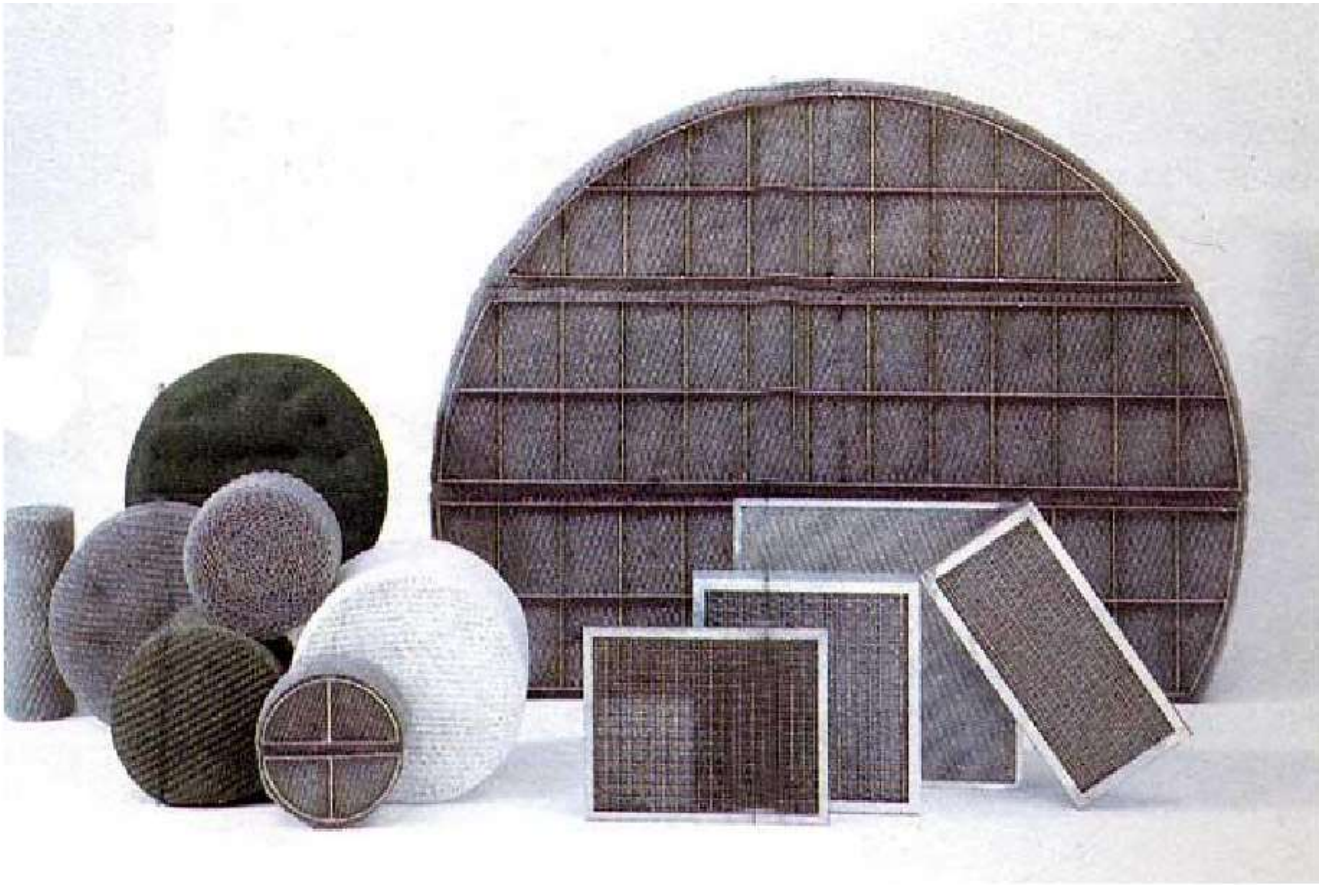

DEMISTER PADS

LNT INDUSTRIAL ENGINEERING SERVICES

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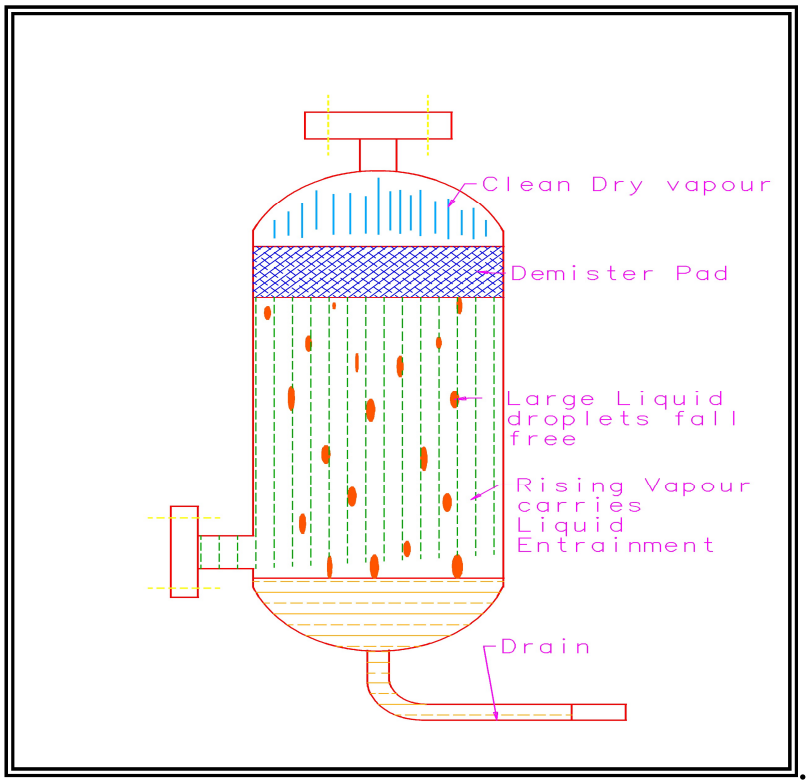
Demister Pad Introduction: *Carry over of particulate matter by gas or vapour, generally termed as "Entrainment" is commonly encountered in Gas-Liquid separations. In many leading industries Demister Pads have gained acceptance as a low cost and highly efficient means of separating Entrained liquid droplets from gas and vapour stream. Because of simplicity of construction Demister Pads can be easily made to any shape and size to suit process configuration in existing or new equipments.*

Construction: *Demister Pads are essentially porous blankets of carefully knitted wire or synthetic fibers designed and constructed to efficiently abate mist particles. After knitting each layer is corrugated and converted into Pads of different shapes and sizes. The Demister is generally supported by Grids as they are not entirely rigid.*

Efficiency: *When properly designed Demister Pads can give Efficiency up to 99.9% with minimal pressure drop. Normally Demister Pads can remove droplets down to 5microns and lower with a free volume of up to 99% and a surface area of up to 1940 m^2/m^3. Due to high value of free volume the pressure drop across the demister pad is sufficiently low, negligible for most applications*



Function: *Demister Pads are installed at some distance above the surface of liquid allows free disengagement of mist droplets and the coarsest particles. The vapour/gas-liquid mixture run at a predetermined velocity through the Demister Pad, the vapour/gas finds an open path through the mesh easily, but due to greater inertia the droplets and mist impinge on the mesh and gradually increase to a bigger size and fall down due to gravity allowing the vapour/gas to pass freely without any Entrainment from the top of the Demister Pad.*

Column packing: *It is used for efficient packing of Distillation columns, which operate at Vacuum or Atmospheric pressure. Column Packing are fabricated by knitting fine wires into a mesh then further crimping the mesh before rolling them for a desired column diameter. Multifilament mesh gives best results due to their capillary action and promotes excellent mixing in vapour stage.*

Advantages of Demister Pads:

- ✓ *Solves Emission control Problems.*
- ✓ *Eliminates or reduces damage caused to the equipment due to corrosive liquid droplets.*
- ✓ *Recovery of valuable liquids.*
- ✓ *Improves purity of gas/vapour for further processes.*
- ✓ *Improves overall process economics.*
- ✓ *Increases process efficiency.*

Materials of Construction: *Demister Pads are made of a variety of Materials as per application demands. A few materials of construction would be synthetic fibers, copper, aluminium, Stainless Steel 304, Stainless Steel 316, Monel, Nickel, Brass, Phosphor Bronze, Carbon Steel, etc,. for different applications like corrosive services, nitric acids, water solutions, Freon, alcohols, fatty acids, corrosive chemicals, food products, hydrocarbons, caustic soda, dilute acids etc,.*

FILTERS

LNT INDUSTRIAL ENGINEERING SERVICES

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LNT INDUSTRIAL ENGINEERING SERVICES has been in the field of Filter manufacturing and fabrication in Filtration and Separation Technology for more than two and a half decades. We specialize in manufacture of Filters, Strainers, Screens, Level gauges, Demister pads, Heat Exchangers, Separators, Atomizers, Agitators, Heaters and other special items. We also undertake manufacture of all of the above mentioned items as import substitutes.

Filters are an invariable part of all Industries. Raw materials like kerosene, diesel, petrol, paraffin used in industries such as Oil & Petroleum are filtered by use of various types of filters.

Other area of Filtration is separation of contaminations in Oxygen, Nitrogen, Argon, Ammonia, Freon, Steam, Water, Acids, Bases, Pharmaceutical Chemicals, Resins, Paint, Wax, etc,.

For all the above mentioned applications various types of filters like Screens, Filter cartridge, Demisting Systems, Separators, etc,. are utilized in various shapes & sizes. Selection of Filters for any application depends upon factors like Maximum Flow Rate, Minimum & Maximum Operating Pressures, Operating Temperature Range, Piping Size, Contaminants to be removed, Degree of Filtration desired, etc,.

For utility of all types of Filters mentioned above proper Filter housing is required to obtain desired filtration. Filter housing selection may be decided depending on the Media to be filtered, application for which filtration is to be done, Operating Pressures and Temperatures, etc,. Materials used for the purpose are Mild steel, Stainless steel, Castings, Copper, Plastic, Glass, Teflon & various other materials.

Filter media depends on the type of Impurity, Size of Impurity, Type of Material to be Filtered, Viscosity of Media to be filtered, State of Media (Solid, Liquid or Gaseous).

PRODUCT RANGE

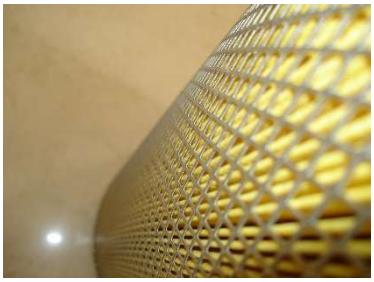
PLEATED MEDIA:

Available in Wire Screen, Paper, Synthetic (woven and non woven), Micro glass fibre and Membrane media with a micron rating of upto 0.1 microns with support parts of Plated steel, Stainless steel, Aluminium, Brass, Plastics etc,. These filters can be supplied in any practical size.

YARN WOUND FILTER

Manufactured in Cotton, Viscose, Polypropylene, Glass fibre with a core of Steel, Plated Steel, Stainless Steel and other Special Material as per the application.

HEPA FILTERS



Made of micro glass fibre with a guaranteed efficiency of 99.97% for upto 0.3 microns. This media is folded and fixed in an Aluminium casing with corrugated Aluminium Separators.

TRAY / PANEL FILTERS

Tray filters consists of a corrugated screen with or without a mesh for separation. Also made of dry fabric consisting of synthetic felt pleated with supporting wire mesh placed in an Aluminium or GI casing. Available in any practical size with a micron rating of upto 5 microns.

OIL FILTERS

An Oil Filter is a filter designed to remove contaminants from transmission oil, lubricating oil, or hydraulic oil. Oil filters are also used in many different types of hydraulic machinery.

DUPLEX FILTERS

Duplex Filter or twin basket Filter is a type of filter built into a fuel, oil or water piping system and it is used to remove large particles of dirt and debris. The duplex Filter system usually consists of two separate strainer basket housings. The system also contains a valve handle placed between the two baskets to divert the flow of liquid to one Filter while the other is being cleaned. On some Filters, the valve will work automatically and the strainer will perform a self-cleaning operation.

STRAINERS

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LNT INDUSTRIAL ENGINEERING SERVICES has been in the field of Strainer manufacturing and fabrication in Filtration and Separation Technology for more than two and a half decades. We specialize in manufacture of Filters, Strainers, Screens, Level gauges, Demister pads, Heat Exchangers, Separators, Atomizers, Agitators, Heaters and other special items. We also undertake manufacture of all of the above mentioned items as import substitutes.

Strainer is a device through which a liquid is passed for purification, filtering or separation from solid matter; anything (including a screen or a cloth) used to strain a liquid; any device functioning as a sieve or filter - in special, a perforated screen or openwork (usually at the end of a suction pipe of a pump), used to prevent solid bodies from mixing in a liquid stream or flow line. In simpler words, a device having holes punched in it or made of crossed wires for separating solid matter from a liquid.

The straining elements are generally made from a wire mesh type screen material or a perforation in sheet metal. In some cases, depending on size and pressure rating, a mesh unit may additionally include a perforation. Using a perforated material in conjunction with a mesh, may be best in providing greater strength and stability to the straining element.

The standard basket or screen material in most strainers today is 304 series stainless steel. 316 stainless steel is also common (often used for additional corrosion resistance). Monel is also a material that can easily be provided. There are many variations of mesh and perforations that are available along with various methods of construction, and support methods, based on specific applications. Selection of Strainers for any application depends upon factors like Maximum flow rate, Minimum & Maximum operating pressures, Operating temperature, Piping size, Contaminants to be removed, Degree of separation desired, etc,.

PRODUCT RANGE

DUPLEX STRAINER / FILTERS

Duplex strainer or twin basket strainer is a type of filter built into a fuel, oil or water piping system and it is used to remove large particles of dirt and debris. The duplex strainer system usually consists of two separate strainer baskets housings. The system also contains a valve handle placed between the two baskets to divert the flow of liquid to one strainer while the other is being cleaned. On some strainers, the valve will work automatically and the strainer will perform a self-cleaning operation.

Y-TYPE STRAINERS

We offer an exceptional range of Y-Strainers, often used for applications with water, steam, oil or fuel. However, these products are also suitable for higher viscosities and other media too. We design, manufacture and supply a simple and an effective product that guarantees to a general use construction. Our strainer is synonymous to quality and used where debris needs to be removed frequently.

BUCKET STRAINERS

Manufactured in a cylindrical or basket shape primarily to be fitted in T-type or Y-type casings. Used in steam, water & petroleum lines for Separation of impurities. Manufactured with use of various materials like Stainless steel, Monel, Brass, etc,.

T-TYPE STRAINERS

Specifically fabricated for the removal of debris, in the protection of fluid and gas handling equipment during the commissioning and start up periods.

These strainers can be installed both horizontally and vertically.

TEMPORARY / CONICAL STRAINERS

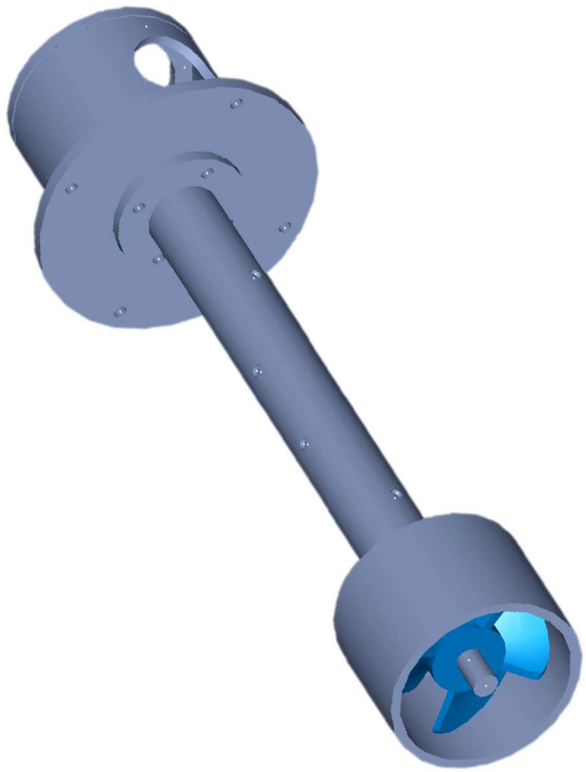
Specifically designed for the filtration of debris, in the protection of fluid and gas handling equipment during the commissioning and start up periods.

The strainers are easily installed between flange without any modification to the surrounding pipework and without the need for special spool pieces.

AGITATORS

Agitator finds its applications at places where different temperatures/densities of liquid exist in the same system e.g. Hot and cold liquid, Agitators can be used at places where the above mentioned conditions exist in a system to make these variables uniform in the entire system, like in ice banks where ice is produced on evaporating coils. Without agitators, there would be no circulation of water in the tanks, it would have different densities and temperatures at different locations in the tank.

An Agitator, if installed in the system circulates the liquid in such a manner that temperature/density of water (also brine, glycerine as per different applications) remains uniform at all points of the system giving proper heat exchange and more efficient cooling for any application.



Another place where Agitators finds its application is mixing of powder with liquids. eg. Milk powder with water, paint powder with turpentine and many other chemicals where reaction takes place only after proper mixing of its elements.

Agitators also work well where mixing of small quantities of some elements (solid or liquids) with a large quantity of fluid like vegetable oil and vitamin A or vitamin D.

Agitators are also useful for pharmaceutical applications for mixing of syrup with drugs, vitamins, etc,. In such application use of Agitators results in uniform distribution of valuable small portions to large portions of other fluids.

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Immersion models of our Agitators are available in various sizes and furnished in various rotor-stator configurations.

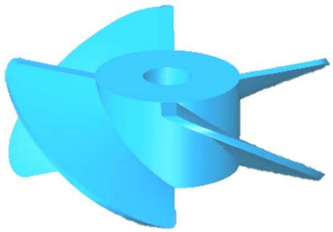
A superior line of Agitators designed for continuous heavy duty service when mixing, dissolving & suspension of solid particles.

Agitators can be mounted with 4-bolt mounting bases for horizontal bases. The rotor blades are specially designed for maximum handling of liquid during operation.

The special design of our Agitators makes it possible to easily assemble and dismantle it for maintenance.

Agitator features:

- ✓ *Available with heavy duty motors from 0.5hp to 10 hp.*
- ✓ *Strong steel casing (Available in Carbon or Stainless Steel).*



- ✓ *Majority of the parts of the Agitator are off the shelf parts for ease of repair and maintenance.*
- ✓ *Easily replaceable propeller shaft.*
- ✓ *Specially designed extra long Journal*
- ✓ *Bearing for extra long life.*

LEVEL GAUGE

All our Level Gauges have been designed and developed to operate reliably and efficiently in all applications where accurate liquid level measurements is required.

Available in a variety of Reflex or Transparent type with lengths from 300mm onwards, with an arrangement to fit a pressure gauge on the Level Indicator itself. Each gauge is ruggedly constructed for durability and maximum resistance to corrosion.

Standard construction includes a solid one piece chamber machined from carbon steel with steel covers and toughened glass windows, recessed gasket seats to prevent gasket movement and ensure leak free service.

Transparent type gauges are specially designed so that liquid level can be seen from both sides of the level gauge, it also facilitates better viewing of liquid level. Special arrangements can also be made for replacement of Pressure gauge without disturbing the system.

Tubular type of level gauges are ready to fit and rugged. No assembly or testing on site. 19mm heavy wall borosilicate glass tube is used. It is protected by a sturdy metallic casing with a window for observation of level. It incorporates an Aluminium scale for an exact readout of volume or level of liquid.

The Visible Length for tubular type of Level Gauge is 140mm less than the centre to centre length specified. Maximum length available is 3m. Special construction with fittings is provided for lengths greater than 3m.

The Valves used with these gauges are equipped with wide choice of connections. Their design incorporates ball check arrangements for safety against leaks.

Table on backside of this page gives reference of visible lengths for Reflex and Transparent types of Level gauges. However, Level gauges can be made to virtually any size as per individual requirements.

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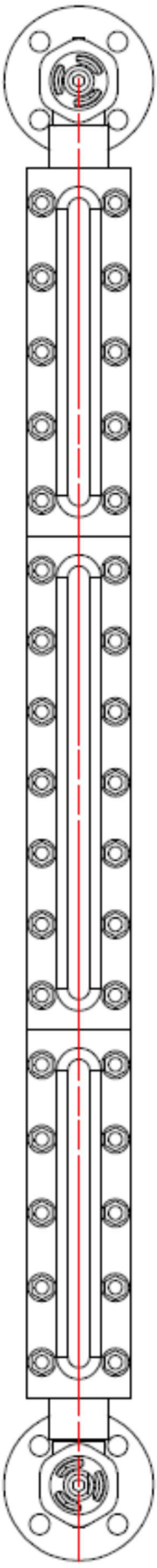

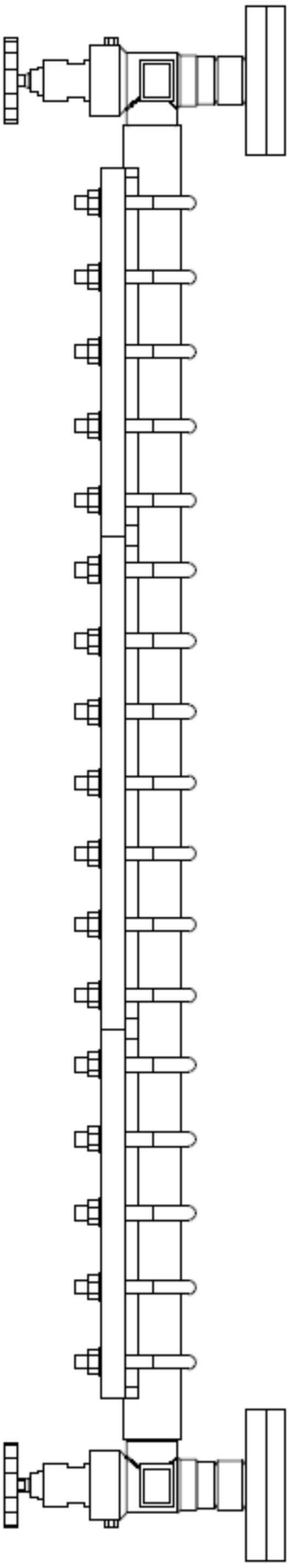

Reflex Level Gauges

Working Conditions :

- Pressure Maximum : 27 Bars
- Temperature Maximum: 150°C

Materials :

- Carbon Steel
- Components in touch with media in AISI 304 / AISI 316
- All Components in AISI 304 / AISI 316

Connections :

- Flanged ANSI B-16.5 #150
- Customized as required

Accessories :

- Drain / Vent Valves
- Graduated Scale

Visible Length Chart for Reflex and Transparent type Level Gauges

Sr. No.	*Size(Centre to Center distance) [mm]*	*Number of Windows*	*Visible length [mm]*
1	350	1	220
2	450	1	325
3	500	1	325
4	600	2	440
5	700	2	545
6	800	2	650
7	900	3	660
8	1000	3	765
9	1100	3	870
10	1200	3	975
11	1400	5	1100
12	1450	4	1195
13	1500	5	1205

- ***Level Gauges can also be custom made as per individual requirements in virtually any size.***
- ***Special arrangements can also be made for replacement of Pressure Gauge without disturbing the system.***
- *Due to continuous product improvement efforts product specifications, dimensions and other product and process parameters are subject to change without prior intimation.*
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STOP VALVES FOR INDUSTRIAL REFRIGERATION

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Index

Introduction:

LNT's Industrial Refrigeration stop valves are available in straight and angle design to meet all industrial refrigeration needs.

These Valves are designed to give favourable flow properties and easy to dismantle and open for repair when necessary.

Features:

- Applicable to all common refrigerants including R717 and non-corrosive gases/liquids dependent on sealing material compatibility.
- Available in straight and angle versions.
- Can accept flow in both directions.
- Pressure Range : 29 bar G.
- Temperature Range : -60°C to 150°C.

Design:
These valves are available in
Butt Weld Connections : ½", ¾", 1", 1 ¼", 1 ½", 2", 3".
Socket Weld Connections : ½", ¾", 1 ¼", 1 ½".
Threaded connections as required.

Housing : Made of special cold resistant steel to withstand low temperature operations.

Spindle : Made of polished stainless steel ideal for O-ring sealing.

Packing gland: Ensures a perfect tightness in the working range (Pressure and Temperature) of the Valve.

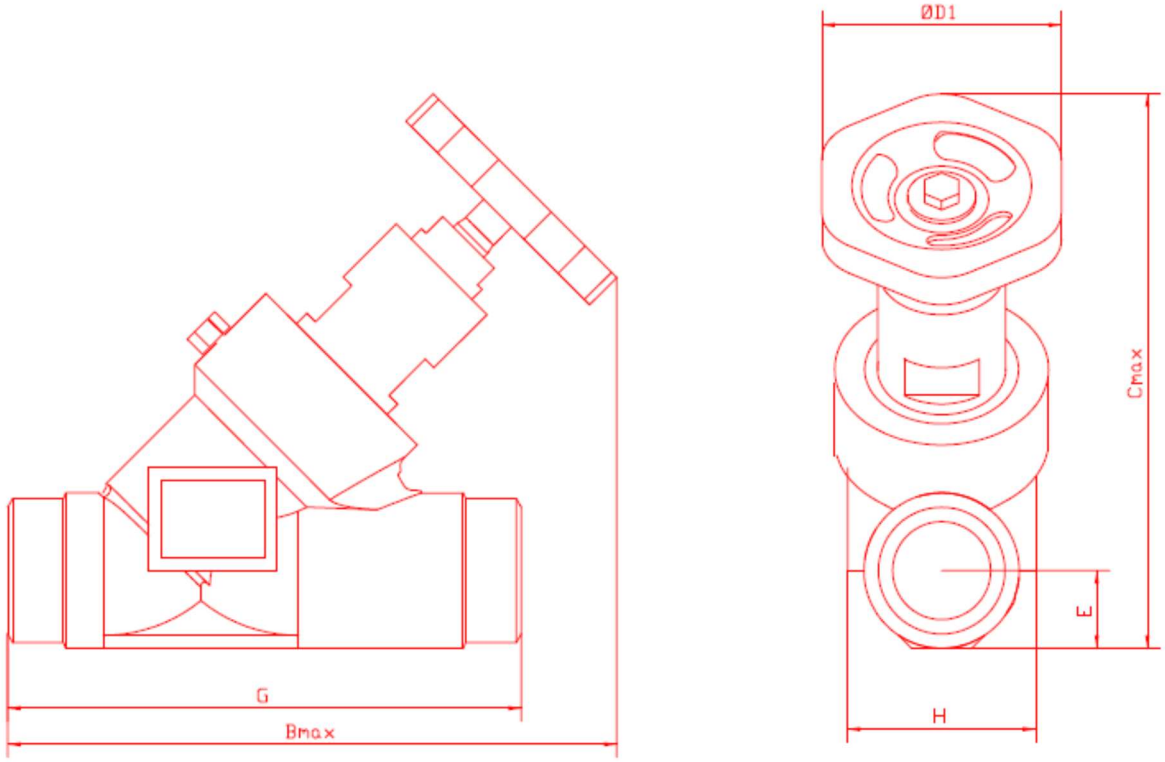
Installation :
It is recommended that the Valves be installed in the direction of flow indicated by the arrow on the valve body. The valve is designed to withstand high internal pressure. However, the piping system in general should be designed to avoid liquid traps and reduce the risk of hydraulic pressure caused by thermal expansion.

Technical Data:

- Applicable to all common refrigerants including R717 and non-corrosive gases/liquids dependent on sealing material compatibility.
- Pressure Range : 29 bar G.
- Temperature Range : -60°C to 150°C.

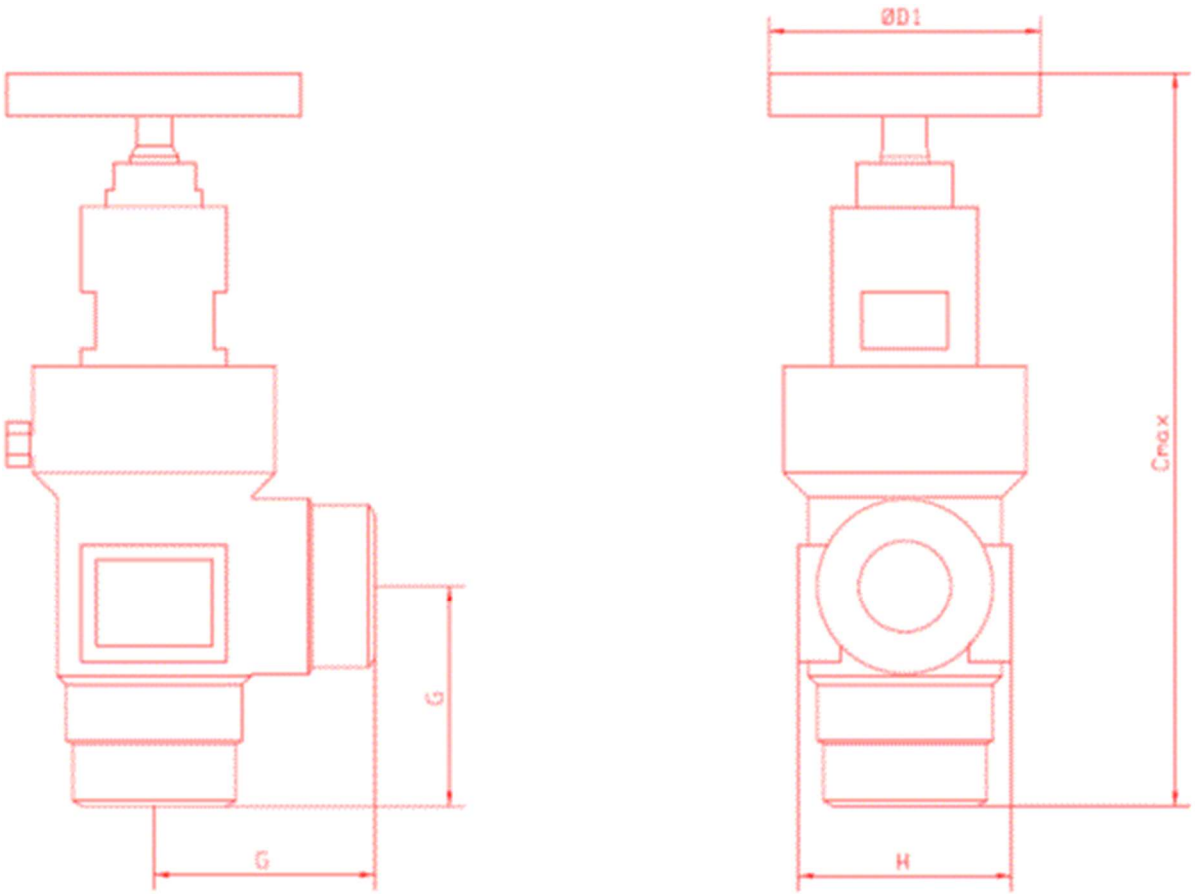
Dimensions and Weights

Straight Valves



Valve Size	Bmax	Cmax	E	G	D1	H
15	154	141	18.5	120	60	44
20	154	141	18.5	120	60	44
25	154	141	18.5	120	60	44
32	215	216	26.5	144	78	60
40	215	216	26.5	144	78	60
50	225	235	32.0	148	100	78
80	330	395	48.0	216	200	130

Angle Valves



Valve Size	Cmax	G	D1	H
15	170	45.5	60	44
20	170	45.5	60	44
25	170	45.5	60	44
32	226	52	78	60
40	226	52	78	60
50	251	60	100	78
80	325	85	200	130

Ordering

Valve Part Numbering:

Item Description		Size		Sealing Seat		Connection		Threading side		Type		Body MOC	
V	Valve	015	15 NB	P	PTFE	S	Socket Weld	I	Internal	Y	Straightway	15	CA-15
S	Strainer	020	20 NB			B	Butt Weld	E	External	A	Angleway	F8	CF8
		025	25 NB			T	BSPT Threaded	N	Nil for non threaded models			8M	CF8M
		032	32 NB			N	NPT Threaded					06	SA106
		040	40 NB									LC	A352LCC
		050	50 NB										
		080	80 NB										

Example of Part Numbering:

V	025	P	B	N	Y	15
Item	Size	Sealing Seat	Connection	Threading	Type	MOC

The above Part Number indicates a

(V) Valve
(025) Size 25NB
(P) Sealing of PTFE material
(B) Butt welded connection
(N) Nil for Non threaded
(Y) Straightway flow
(15) Material CA-15

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STRAINERS FOR INDUSTRIAL REFRIGERATION

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Introduction:

LNT's Industrial Refrigeration Strainers are available in straight and angle design to meet all industrial refrigeration needs.

These Strainers are designed to give favourable flow properties and easy to dismantle and open for repair when necessary.

Features:

- Applicable to all common refrigerants including R717 and non-corrosive gases/liquids dependent on sealing material compatibility.
- Available in straight and angle versions.
- Can accept flow in both directions (to be mentioned during ordering).
- Pressure Range : 29 bar G.
- Temperature Range : -60°C to 150°C.

Design:
These Strainers are available in
Butt Weld Connections : ½", ¾", 1", 1 ¼", 1 ½", 2", 3".
Socket Weld Connections : ½", ¾", 1 ¼", 1 ½".
Threaded connections as required.

Housing : Made of special cold resistant steel to withstand low temperature operations.

Packing gland: Ensures a perfect tightness in the working range (Pressure and Temperature) of the Strainer.

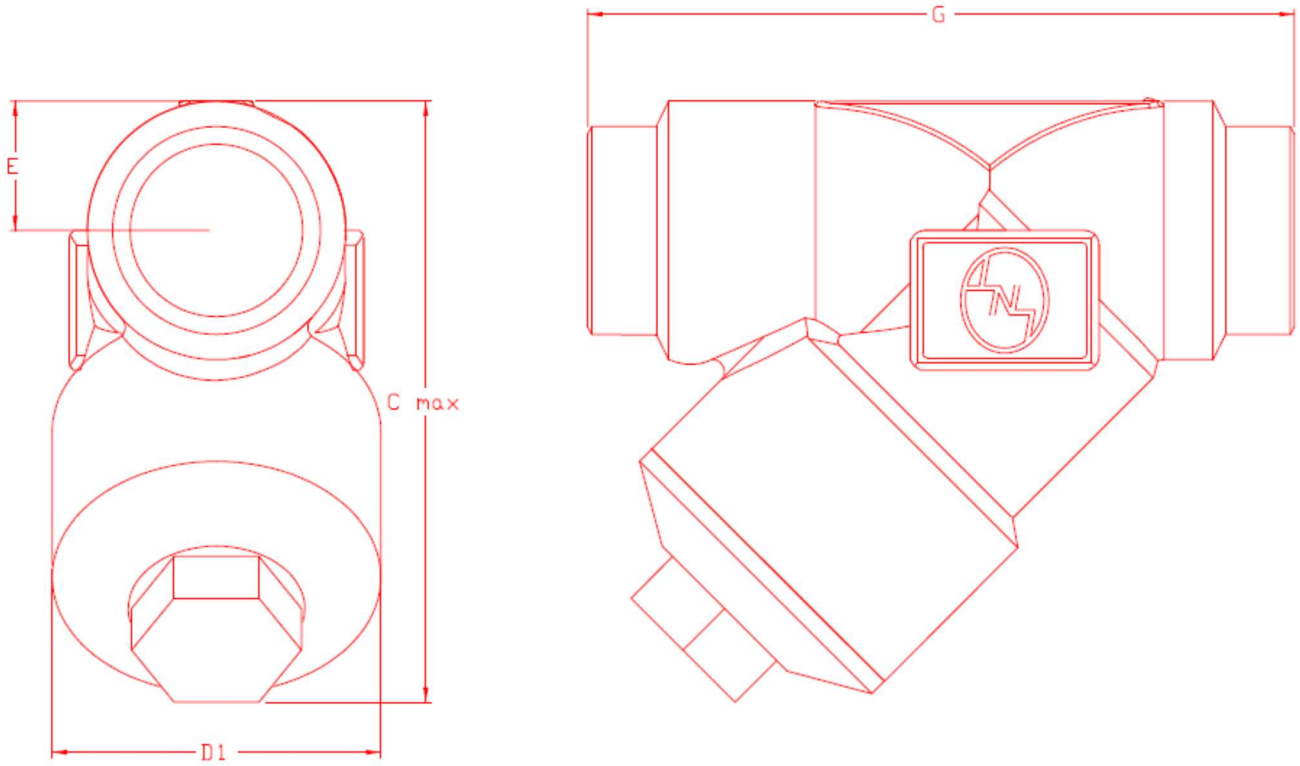
Installation :
It is recommended that the Strainers be installed in the direction of flow indicated by the arrow on the Strainer body. The Strainer is designed to withstand high internal pressure. However, the piping system in general should be designed to avoid liquid traps and reduce the risk of hydraulic pressure caused by thermal expansion.

Technical Data:

- Applicable to all common refrigerants including R717 and non-corrosive gases/liquids dependent on sealing material compatibility.
- Pressure Range : 29 bar G.
- Temperature Range : -60°C to 150°C.

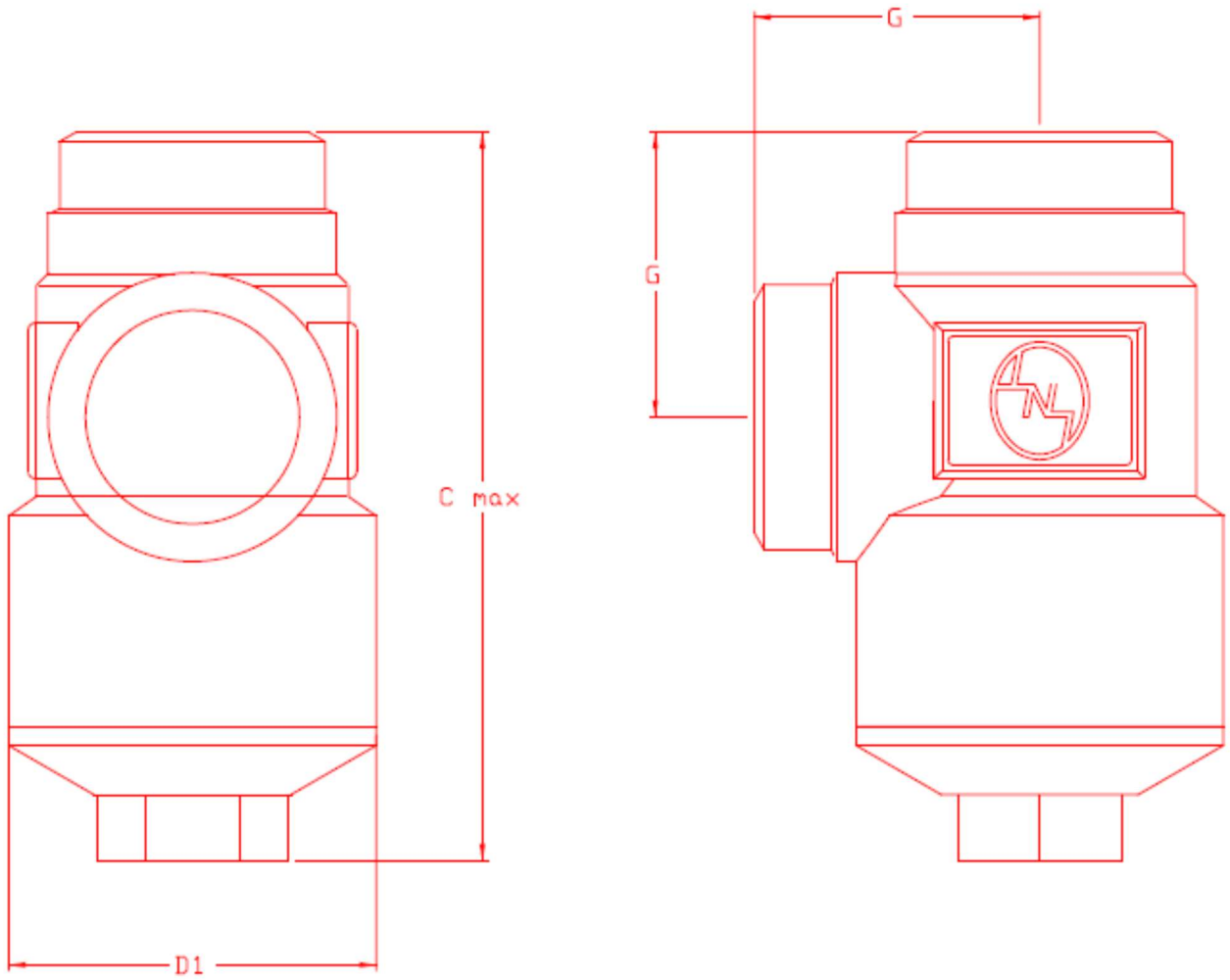
Dimensions and Weights

Straight Strainers



Strainer Size	Cmax	E	G	D1
15	89	18.5	120	50
20	89	18.5	120	50
25	89	18.5	120	50
32	123	26.5	144	67
40	123	26.5	144	67
50	136	32.0	148	78
80	205	48.0	216	129

Angle Strainers



Strainer Size	Cmax	G	D1
15	112	45.5	50
20	112	45.5	50
25	112	45.5	50
32	133	52	67
40	133	52	67
50	124	60	78
80	178	85	129

Ordering

Strainer Part Numbering:

Item Description		Size		Sealing Seat		Connection		Threading side		Type		Housing MOC	
V	Valve	015	15 NB	P	PTFE	S	Socket Weld	I	Internal	Y	Straightway	15	CA-15
S	Strainer	020	20 NB			B	Butt Weld	E	External	A	Angleway	F8	CF8
		025	25 NB			T	BSPT Threaded	N	_Nil for non threaded models			8M	CF8M
		032	32 NB			N	NPT Threaded					06	SA106
		040	40 NB									LC	A352LCC
		050	50 NB										
		080	80 NB										

Example of Part Numbering:

S	025	_	B	N	Y	15
Item	Size	Sealing Seat	Connection	Threading	Type	MOC

The above Part Number indicates a
(S) Strainer
(025) Size 25NB
(P) _ for none
(B) Butt welded connection
(N) Nil for Non-threaded
(Y) Straightway flow
(15) Material CA-15