Nicoson®

WHY CHOOSE NICOSON INVERTED BUCKET TRAPS ?

1.Water sealed against steam loss

Discharge valve is water sealed. Steam does not reach it.

2.Operating against water hammer and hydraulic shock

Cage type water Hammer Resistor can dispersing water hammer or hydraulic shock wave. This prevent the bucket from smashing against and damage the mechanism

3.Long life service

Valve and seat are chrome steel hardened, ground and lapped, All other working parts are wear and corrosion resistant stainless steel.

4.Continuous air and co_2 venting

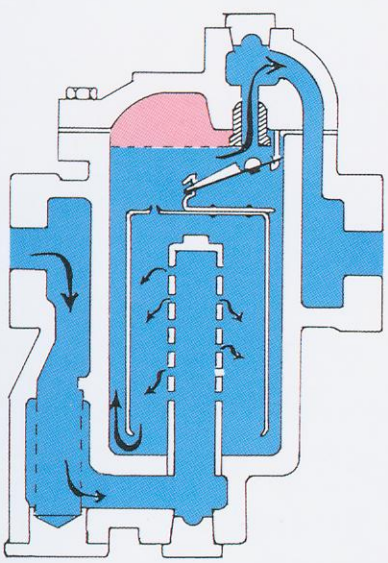
Vent in top of bucket provides continuous automatic air venting and co_2 venting at steam temperature.

5.High back pressure operation

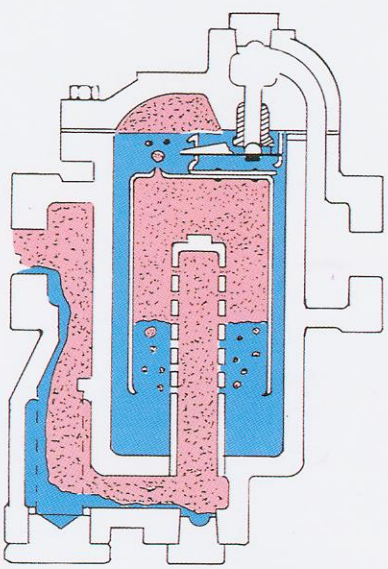
Since trap operation is governed solely by the difference in density of steam and water, back pressure in the return line has no effect on the ability of the trap to open for condensate and close against steam.

HOW THEY WORK

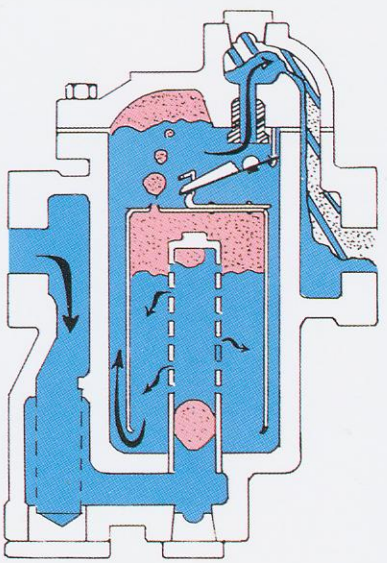
Condensate **Steam** **Air**



1. When air and condensate enters the trap and flows under botom edge of bucket it fills trap body and completely submerges inverted bucket, condensate then discharges through wide open valve to return lines.



2. Steam also enters trap, it rises and collects at bucket top. Bucket then rises and lifts valve toward its seat until valve is snapped tightly shut. Air and non-condensible gases continuously pass through bucket vent and collet at top of trap.



3. When condensate level reaches opening line the weight of the bucket, the bucket sinks, opening the valve., Any accumulated air is discharged first followed by condensate. Entery steam returns the valve to closed position.

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CONTINUOUS AIR VENTING

Vent in top of bucket provides continuous automatic air venting and prevents air binding. Steam passing through the vent is less than that required to compensate for radiation loss from the trap so it is not wasted.

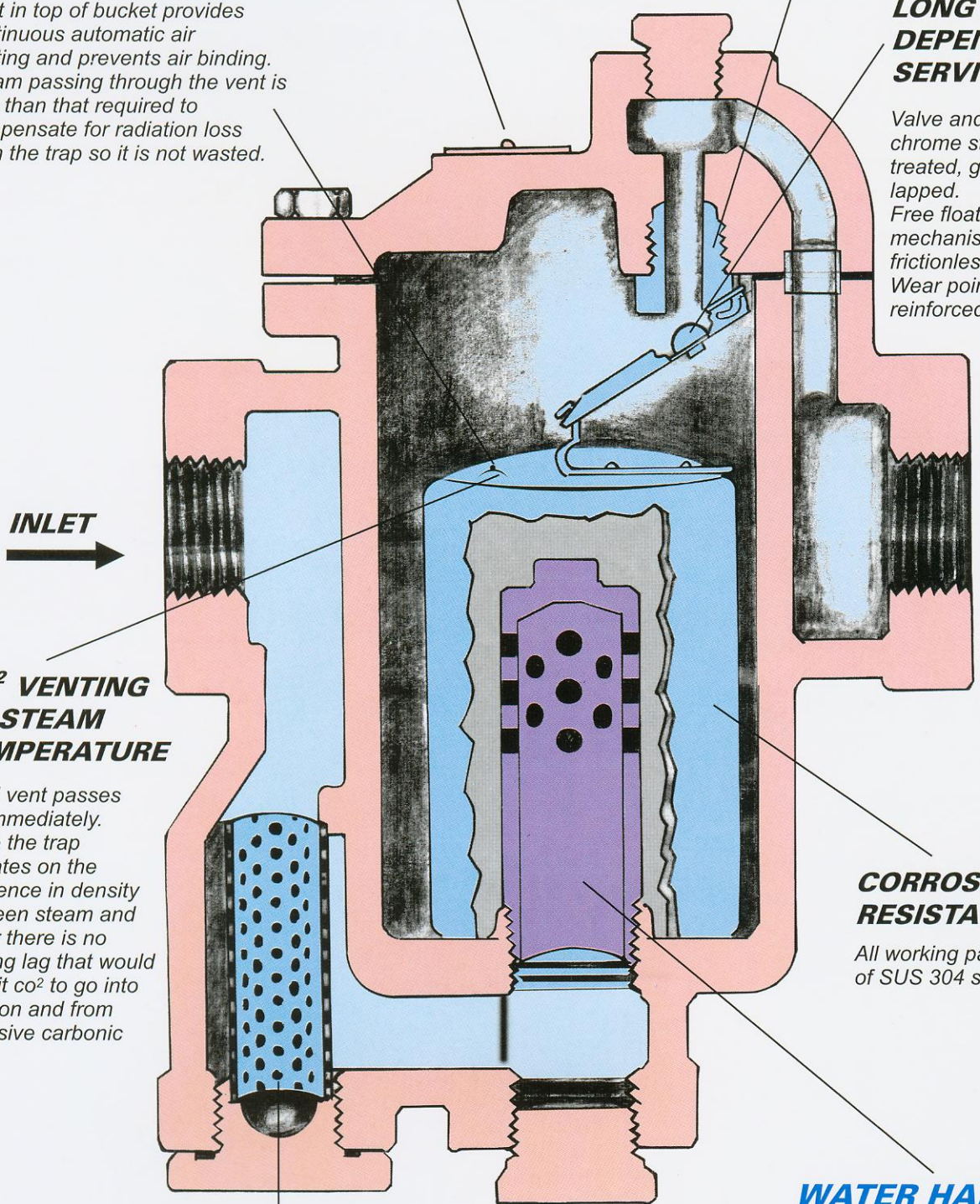
NAME PLATE

NO STEAM LOSS

Discharge valve is water seal. Steam does not reach it.

LONG LIFE AND DEPENDABLE SERVICE

Valve and seat are chrome steel, heat treated, ground and lapped.
Free floating valve mechanism is frictionless.
Wear point are heavily reinforced.



CO^2 VENTING AT STEAM TEMPERATURE

Fixed vent passes co^2 immediately. Since the trap operates on the difference in density between steam and water there is no cooling lag that would permit co^2 to go into solution and from corrosive carbonic acid.

CORROSION RESISTANCE

All working parts are made of SUS 304 stainless steel.

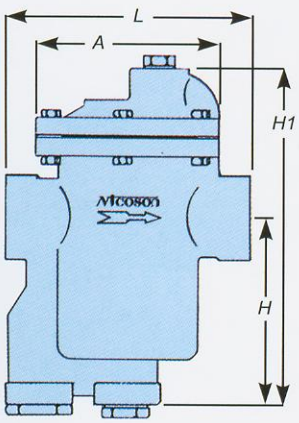
WATER HAMMER RESISTOR

Cage type water hammer resistor can dispersing water hammer or hydralic shock wave.
This prevent the bucket from smashing against and damage the mechanism.

INTEGRAL STRAINER DESIGN IS FREE FROM DIRT PROBLEMS

Stinless steel integral strainer, Dirt does not reach trap.

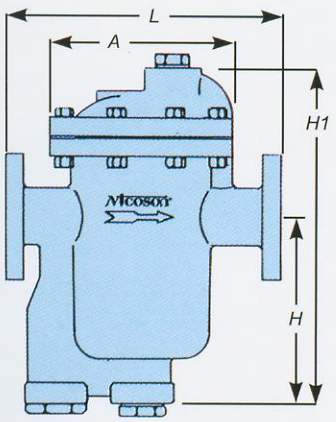
NICOSON INVERTED BUCKET STEAM TRAP SPECIFICATION AND DIMENSIONS



SCREWED TYPE

Trap Model	connection PT	L M/M	H	H1	A	Weight KG	M.O.P Kg/cm²
B1	1/2", 3/4", 1"	128	100	175	96	3.5	18
B2	3/4", 1"	166	133	228	144	7.2	18
B3	1"	198	173	296	178	13.5	18
B4	1-1/4", 1-1/2"	232	185	347	203	21	18

NOTE : Connection NPT are available



FLANGED TYPE

Trap Model	connection JIS 10K, RF	L M/M	H	H1	A	Weight KG	M.O.P Kg/cm²
B1F	1/2", 3/4", 1"	170	100	175	96	4.8, 5, 6	18
B2F	3/4", 1"	210	133	228	144	9, 10	18
B3F	1"	240	173	296	178	15	18
B4F	1-1/4", 1-1/2"	280	185	347	203	24, 25	18
B5F	1-1/2", 2"	300	223	388	230	31, 33.5	18
B6F	2"	350	260	446	273	45.5	18

NOTE : ANSI 150 LBS RF Flanged are available.

List Of Materials, NICOSON Cast Iron Traps

Name of part	Material
Cap and Body	Tensile Cast Iron Fc 22
Valve Seat	Heat Treated Chrome Steel
Valve	Heat Treated Chrome Steel
Gasket	Compressed Asbestos
Lever	Stainless Steel SUS 304
Valve Retainer	Stainless Steel SUS 304
Bucket	Stainless Steel SUS 304
Integral Strainer	Stainless Steel SUS 304
Water hsmmer Resister	Steel

NAME PLATE

Model : STEAM TRAP Model Number

Max.p. : THIS STEAM TRAP Max. OPERATING PRESSURE KG/CM²

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NICOSON INVERTED BUCKET TRAPS CAPACITY TABLE

Trap Model	Trap Max. Operating Pressure kg/cm²	CAPACITY IN KG/HR AT INLET DIFFERENTIAL PRESSURE kg/cm²									
		1	2	3	5	6	8	10	12	14	18
B1, B1F	3	350	480	510							
	5	240	330	380	450						
	10	180	240	290	350	370	400	400			
	14	120	170	210	270	290	330	330	380	400	
	18	100	140	170	210	230	270	270	310	330	350
B2, B2F	3	730	950	1,200							
	5	520	720	920	1,100						
	10	370	500	600	780	820	950	1,200			
	14	230	320	390	490	550	630	700	750	850	
	18	100	200	280	380	400	480	550	600	650	730
B3, B3F	3	1,450	1,800	1,980							
	5	1,300	1,600	1,900	2,200						
	10	800	950	1,350	1,650	1,800	2,100	2,300			
	14	100	800	1,000	1300	1,450	1,680	1,850	1,950	2,200	
	18	500	700	950	1,200	1,300	1,500	1,600	1,700	1,800	1,900
B4, B4F	3	2,800	3,200	3,600							
	5	1,900	2,300	3,100	3,600						
	10	1,500	1,800	2,400	3,000	3,100	3,400	3,650			
	14	1,300	1,600	1,800	2,400	2,600	3,000	3,300	3,400	3,500	
	18	900	1,000	1,600	1,800	2,150	2,450	2,600	2,800	3,300	3,100
B5F	3	3,500	4,800	6,000							
	5	3,000	3,500	4,800	5,900						
	10	1,800	2,400	3,100	4,400	4,500	5,300	5,300	5,600		
	14	1,800	2,500	3,000	3,500	3,800	4,300	4,800	5,100	5,400	
	18	1,500	2,000	2,500	3,000	3,300	3,700	4,100	4,400	4,800	5,100
B6F	3	8,000	9,500	10,000							
	5	6,500	8,000	8,800	10,000						
	10	4,000	5,000	6,500	8,000	8,500	9,300	9,600			
	14	3,500	4,500	5,500	7,000	7,500	8,300	9,000	9,200	9,400	
	18	2,500	4,000	4,800	6,000	6,500	7,500	8,300	8,500	8,900	9,100

Inverted bucket steam trap selection using NICOSON CAPACITY TABLE is easy, when you know the Condesate load, Safty factor and Pressure differential.
EXAMPLE;

Given :
1. Steam supply — 8 kg/cm²
2. Condensate load — 600 kg/hr
3. Safty factor —3

Time 3 to 600 = 1,800 kg/hr

Enter Table on Max. Operating pressure 10 kg/cm² row at 8 kg/cm² Inlet differential pressure.

We find Trap Model B3, Max. Operating Pressure 10 kg/cm² type, Capacity is 2,100 kg/hr. Can handle that jobs.

HOW TO CHOICE NICOSON INVERTED BUCKET TRAPS

IN ORDER TO GET FULL BENEFITS FROM THE TRAPS DESCRIBDE IN THE PRECEDING SECTION, IT IS NECESSARY THAT THE CORRECT SIZE AND PRESSURE OF TRAP BE SELECTED FOR EACH JOB. AND IT BE PROPERLY INSTALLED AND MAINTAINED.

Do it yourself sizing is required at time. Fortunately trap sizing is simple when you known or can figure.

1. Condensate loads in kg/hr.
2. Pressure differential.
3. The safety factor to use.
4. Accurate trap capacity data.

CONDENSATE LOADS IN KG/HR.

You can get from formula or your exchanger designs steam consumption data.

PRESSURE DIFFERENTIAL

Maximun differential is difference between boiler or steam main pressure and return line pressure.
The trap must be able to open against the pressure differential.
When you select the steam trap operating pressure must be higher than pressure differentisl.

SAFETY FACTOR TO USE

Safety fators will vary from a low 2 to 1 high of 10 to 1.
A 300 kg/hr. Trap would hardly be enough for a 300kg/hr capacity steam unit at 7kg/cm^2 differential pressure. The condensate formed might be more than 300 kg/hr, or the differential pressure might drop to 6 kg/cm^2, Extra trap capacity is needed and costs very little.

ACCURATE TRAP CAPCITY DATA

Now turn NICOSON TRAP CAPACITY TABLE and you will find which trap is best suit for your needs.

HOW TO ORDER NICOSON STEAM TRAPS

1. Specify steam trap Model.
2. Specify size of pipe connection, when flanged are required, specify type of flanged in detail
3. Specify steam trap Maxium operating pressure.

EXAMPLE;

Trap Model	*Connection*	*Max. Operatin presasure*	*Quantity*
B3	***1" NPT***	***10 kg/cm^2***	***500 pcs***

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INVERTED BUCKET TRAPS— COMPARATIVE REFERENCE

NICOSON	ARMSTRONG	TLV	MIYAWAKI
B1	800, 880 1010 811,881, 211, 1011, 1811	UFO 3A UFO 3B UFO 3C	ES 5, ES8 ES 10
B2	812,882, 1012	UFO 5A	ES 12
B3	813, 883, 1013	UFO 5B	ER 105
B4	814, 214	UFO 7EA	ER 110
B5	215	UFO 7FB	ER 116
B6	216	——	ER 120

HOW TO INSTALL NICOSON STEAM TRAP

BEFORE INSTALLING

Before installing the traps, First check the steam traps Max. Operating pressure on Name Plate must be over this jobs supply pressure. Then blow out line with steam or compressed air. This is to remove loose dirt, scale, pipe cuttings, Which could clog trap right from the start.

INSTALL TRAP'S POSITION

1. Below and close to unit being drained. *2. In an accessible location for service.* *3. In an upright position.*

WHEN STARING UP

Prime trap by closing outlet valve and opening inlet valve slowly.
Then open outlet valve. If trap fails to catch prime due to small amount of condensate in the line, trap may be primed by pouring water in through test outlet.

SHORT CIRCUITING

If more than one drain point is connected to a single trap, condensate and air from one or more of the units may fail to reach the trap. Any difference in condensing rates will result in a difference in the steam pressure drop. A pressure drop difference too small to register on a pressure gauge is enough to let steam from the higher pressure drip point block the flow of air or even condensate from the lower pressure drip point.
The net result is sluggish heating, reduced output and fuel waste.

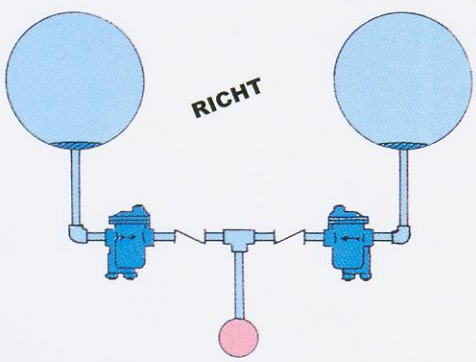


FIG. 7-A *Short circuiting is impossible when each unit is drained by its own trap. Higher efficiency is assured.*

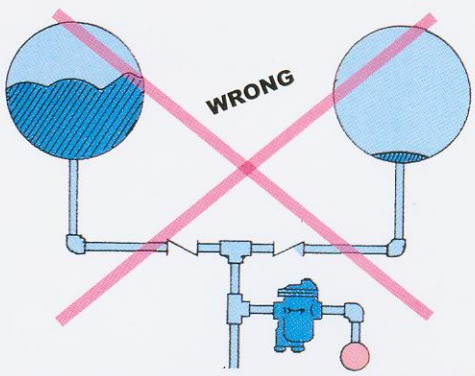


FIG. 7-B *Two steam consuming units drained by a single trap may result in short circuiting.*

HOW TO TEST AND TROUBLE SHOOTING

For maximum trap life and steam economy, a regular schedule should be set up for trap testing and preventive maintance. Traps should be checked.

Medium Pressure Traps : ***3-18 kg/cm²***
Testing weekly to monthly.

Low Pressure Traps : ***0-3 kg/cm²***
Test monthly to annually.

The test valve method is best. Fig.1 shows correct hookup, with shut-off valve in return line to isolate trap from return header. Here is what to look for when test valve is opened :

1. CONDENSATE DISCHARGE

Inverted bucket traps should have an intermittent condensate discharge.

2. FLASH STEAM

Do not mistake this for a steam leak through the trap valve.
Condensate under pressure holds more heat units--
Kcal per kg than condensate at atmospheric pressure.
When hot condensate or boiler water, under pressure, is released to a lower pressure, part of it is reevaporated.
Becoming what is known as flash steam. Chart 9-1 shows the amount of secondary steam that will be formed when discharging condensate to different pressures.

3. CONTINUOUS BLOW — TROUBLE

If an inverted bucket trap discharges continuously, at full capacity, check the following :
A. Trap too small
1. A larger trap, or additional traps should be installed in parallel.
2. High pressure traps, may have been used for a low pressure job.
B. Abnormal water conditions.
Boiler may foam or prime. Throwing large quantities of water into steam lines. A separator should be installed or else the feed water conditions remedied.
C. Trap fail—Change new trap.

4. NO FLOW — Possible trouble, Check the following

Clod Trap — No Discharge

A. Operating Pressure may be too high.
1. Wrong Pressure originally specified.
2. Pressure Reducing Valve out of order.
3. Pressure gauge in boiler reads low.
4. High vacuum in return line increases pressure differential beyond which trap may operate.
B. No condensate or steam coming to trap.
1. Stopped by plugged strainer ahead of trap.
2. Broken valve in line to trap.
3. Pipe line or elbows plugged.
C. Trap fail-- Change new trap.

Hot Trap — No Discharge

No condensate coming to trap

1. *Trap installed above leaky bypass valve.*
2. *Broken or damaged syphon pipe in syphon drained cyliner.*
3. *Vacuum in water heater coils may prevent drainage. Install a vacuum breaker between the heat exchanger and the trap.*

5. STEAM LOSS

If the trap blows live steam, trouble may be due to any of the the following causes :

A. Inverted bucket trap may loss its prime.

1. *If the trap in blowing live steam, close the inlet valve for a few minutes, Then gradually open, If the trap catches its prime. The chances are that the trap is all right.*
2. *Prime loss is usually due to sudden or frequent drops in steam pressure, On such jobs, the installation of a check valve is called for --- location A or B in Fig.3*
3. *If possible locate trap well below drop point.*

B. Trap fail-Change new trap.

6. SLUGGISH HEATING

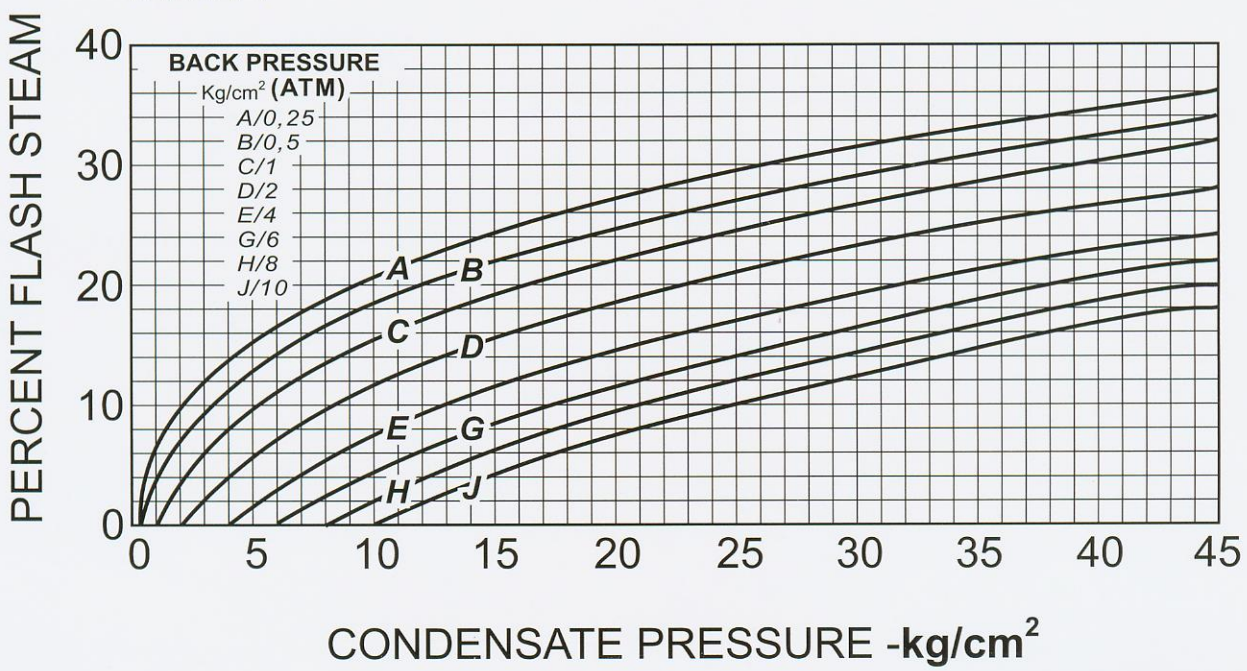
When trap operates satisfactorily, but unit fails to heat properly :

A. One or more units may be short-circuiting and the remedy is to install a trap on each unit. Fig 7-A, Fig 7-B

B. Traps may be too small for job even though they may appear to be handling the condensate efficiently. Try next-sized larger trap.

C. Trap may have insufficient air handling capacity, or the air may not be reaching trap. In either case, use auxiliary air vents.

CHART 9-1



For convenience Chart 9-1 shows the amount of secondary steam that will be formed when discharging condensate to different pressures.

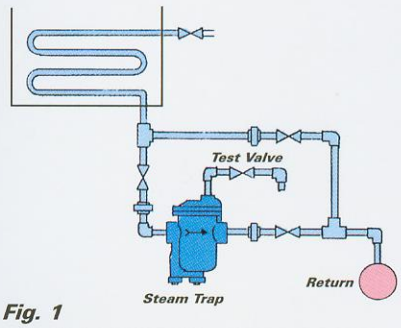


Fig. 1
TYPICAL NICOSON STEAM TRAP BYPASS HOOK UP

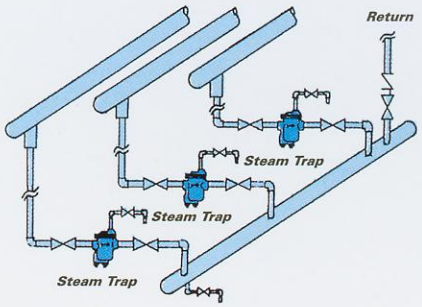


Fig. 2
TYPICAL TRACER LINES INSTALLATION

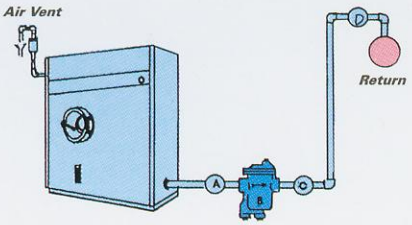


Fig. 3
POSSIBLE CHECK VALVE LOCATION

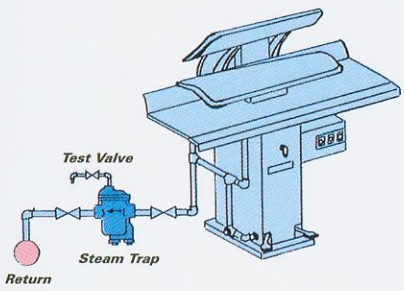


Fig. 4
LAUNDRY PRESS

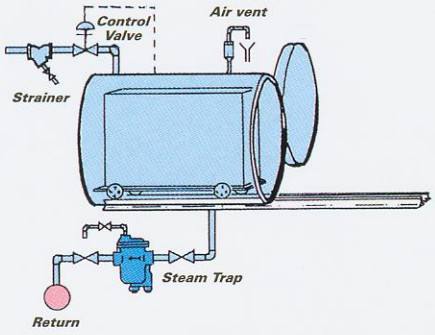


Fig. 5
DIRECT STEAM INJECTION INTO PRODUCT CHAMBER

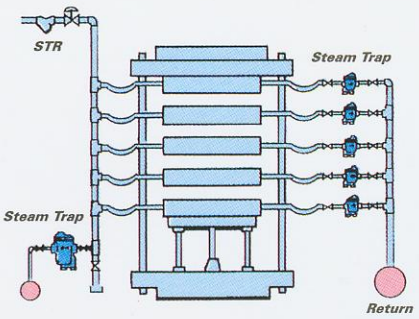


Fig. 6
PRODUCT CONFINED IN STEAM JACKETED PRESS

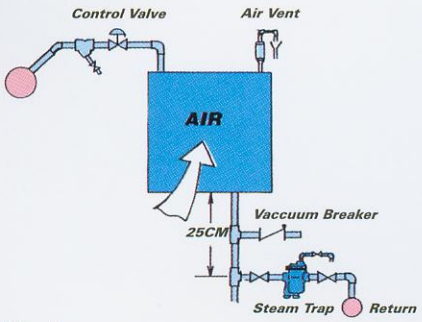


Fig. 7
TRAPPING AND VENTING AIR HEAT COIL

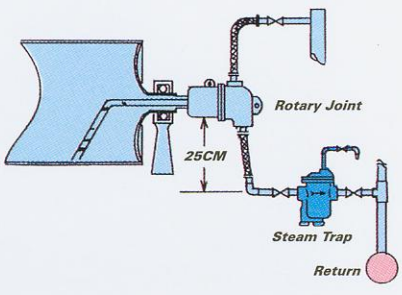


Fig. 8
A REVOLVING CYLINDER DRAINED WITH A SYPHON

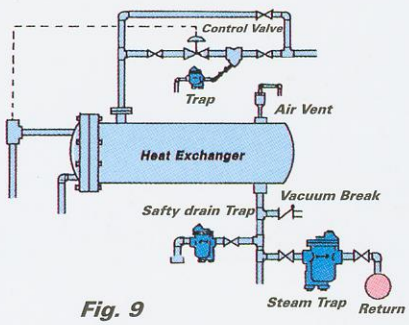


Fig. 9
SHELL AND TUBE HEAT EXCHANGERS