

Cooler Drainlines and Traps

The purpose of this Technical Bulletin is to give guidance on the sizing and fabrication of air cooler drainlines and traps. Section 2.0 has been amended to clarify our preferred materials.

1.0 Introduction

In the past we have had problems maintaining air cooler drain lines. Good design including the provision of rodding points for cleaning and which allow easier replacement of drainline heater tapes can help to eliminate these problems.

Star prefer metal drainlines from air coolers and these should be trapped to prevent outside air being drawn up them but the trap should be heated to avoid freezing if the store is to be operated below 0°C.

Star Standard Specification No. 143 provides details of our preferred types of heater tape and specifies how they are to be used.

2.0 Fabrication

The preferred material for drainlines is steel but some Chill Store operators specify that plastic drains must be used because they are frightened that the cooler may be pulled down if a fork lift truck catches a robust steel drain. Plastic shall not be used for drainlines that are trace heated. Copper drain lines shall not be used as they tend to show verdigris which makes them look bad and difficult to clean properly.

3.0 Coolers with Hot Gas, Reverse Cycle or Electric Defrost

Reverse cycle and hot gas defrost coolers in particular can remove frost from coolers very quickly and the drain header needs to be sized to cope with a large flow rate over a short time.

The drainpipe diameter connecting the cooler to the header must never be less than the cooler drain pan connections.

The maximum number of coolers that can be defrosted together at any one shall be taken into account and the minimum drain header size taken from the following table.

Individual Cooler Drain Sizes	Maximum number of coolers defrosting together					
	1	2	3	4	5	6
	Minimum drain header size NB					
25mm NB Cooler drain pan connection	25	32	50	50	63	63
32mm NB Cooler drain pan connection	40	50	63	63	75	75
1 x 40mm NB Cooler drain pan connection or 2 x 25mm NB Cooler drain pan connection	40	50	63	75	100	100
1 x 50mm NB Cooler drain pan connection or 2 x 32mm NB Cooler drain pan connection or 2 x 40mm NB Cooler drain pan connection	50	75	75	100	100	125
1 x 63mm NB Cooler drain pan connection	63	100	100	125	150	150
1 x 75mm NB Cooler drain pan connection or 2 x 50mm NB Cooler drain pan connection	75	100	125	150	200	200
2 x 63mm NB Cooler drain pan connection	100	125	150	200	200	250
3 x 63mm NB Cooler drain pan connection	125	150	200	250	---	---

TB 135 Table 1 Minimum header size for coolers with forced defrosting

4.0 Coolers without Forced Defrosting

Production area coolers which run continuously without defrost will remove moisture from the room but in all cases the flow in the drain header will be low.

See table below for recommended minimum header size.

Individual Cooler Drain Size	Maximum number of coolers on header	
	Up to 10	11-15
	Minimum drain header size NB	
25mm NB Cooler drain pan connection	40	50
32mm NB Cooler drain pan connection	40	50
1 x 40mm NB Cooler drain pan connection or 2 x 25mm NB Cooler drain pan connection	50	63
1 x 50mm NB Cooler drain pan connection or 2 x 32mm NB Cooler drain pan connection or 2 x 40mm NB Cooler drain pan connection	63	75
1 x 63mm NB Cooler drain pan connection	75	100
1 x 75mm NB Cooler drain pan connection or 2 x 50mm NB Cooler drain pan connection	75	100
2 x 63mm NB Cooler drain pan connection	100	125

TB 135 Table 2 Minimum header size for coolers without forced defrosting

4.1 Typical Cooler Drain Sizes

If the cooler drain connection size is not available when sizing the main drain header use the following typical sizes.

Cooler Duty kW	Drain NB
<10	25
10-50	32 or 40
50-75	40
75-100	1 x 50 or 2 x 40
100-175	1 x 63
175-200	2 x 63
250	3 x 63

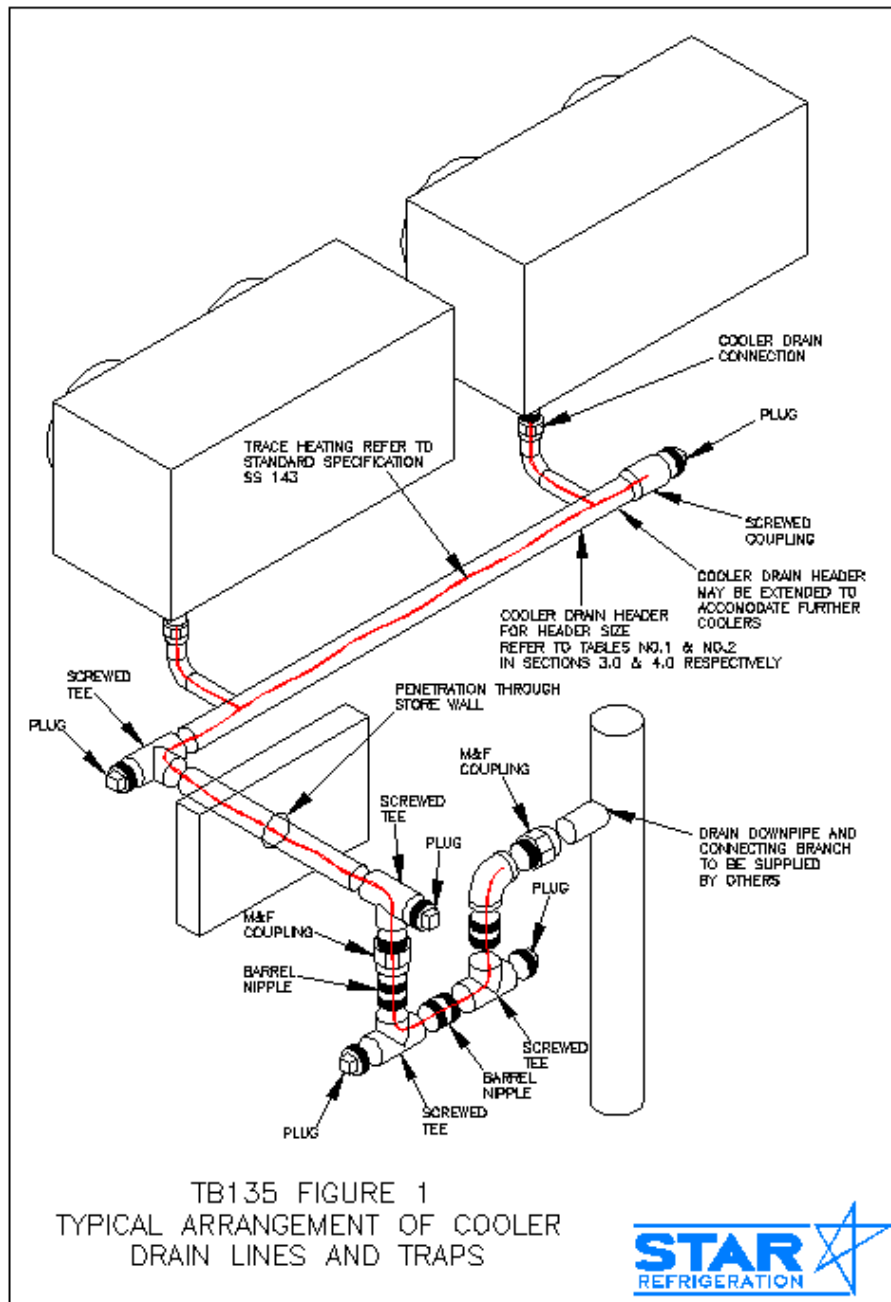
TB 135 Table 3 Guide to drain line sizes

5.0 Water Defrost Systems

The above tables are not applicable to water defrost systems. For water defrost systems the drains must be sized for a maximum velocity of 0.6m/s for the water flow for defrost specified by the manufacturer.

6.0 Typical Arrangement

A typical arrangement of cooler drain lines and traps is given as Figure 1.



Date	Issue	Changes	Originator
23/09/04	A		AG
24/02/05	B	Materials specified in section 2.0.	AMG