

Technical News Bulletin

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VERTI-Flow Blow Mold Cooling System with individual air supply

1. Introduction

In addition to the well known Series 9700 Blow Mold Cooling mechanisms EMHART GLASS SA offers now, as a standard option, a Blow Mold Cooling System with direct air supply to the mechanisms. This system not only allows to optimise the cooling air pressure for blank and blow mold cooling. It also renders a further improvement of mold surface temperature homogeneity by a more equal air velocity pattern. Essentially the direct air supply to the mechanism requires the corresponding air ducts in the machine bed. Consequently field conversion to this system is not possible.

2. Description

The design concept of the Verti-Flow through bed mechanisms follows that of the Series 9700 mechanisms. This is the separation into two main subassemblies – an upper and a lower support bracket assembly, bolted together by four screws and two positioning dowels (Fig. 1).

The upper support bracket assemblies are those of the Series 9700 mechanisms and comprise the plenum chamber, vacuum passage and distributor plate.

The lower support bracket assembly is the cooling air connection from the machine bed to the upper support bracket assembly. It consists of the support bracket itself, the height adjustment gear and an air duct secured to the machine bed. At height adjustment of the mechanism the support bracket slides over this air duct.

Two lower assemblies cover the whole range of mechanism types. One for the Type IS 5" sections for SG, DG 5" and TG 85 operation, and one for all other center distance configurations. This simplifies the conversion from e.g. SG to DG, or vice versa, since only the upper part has to be exchanged.

Cooling air supply to the mechanism is controlled by a butterfly valve located under the machine floor (Fig. 2). The valve actuator is air operated and timed by the machine timing system. The butterfly valve is flange mounted to an adapter duct, which in turn is flanged to the underside of the machine bed.

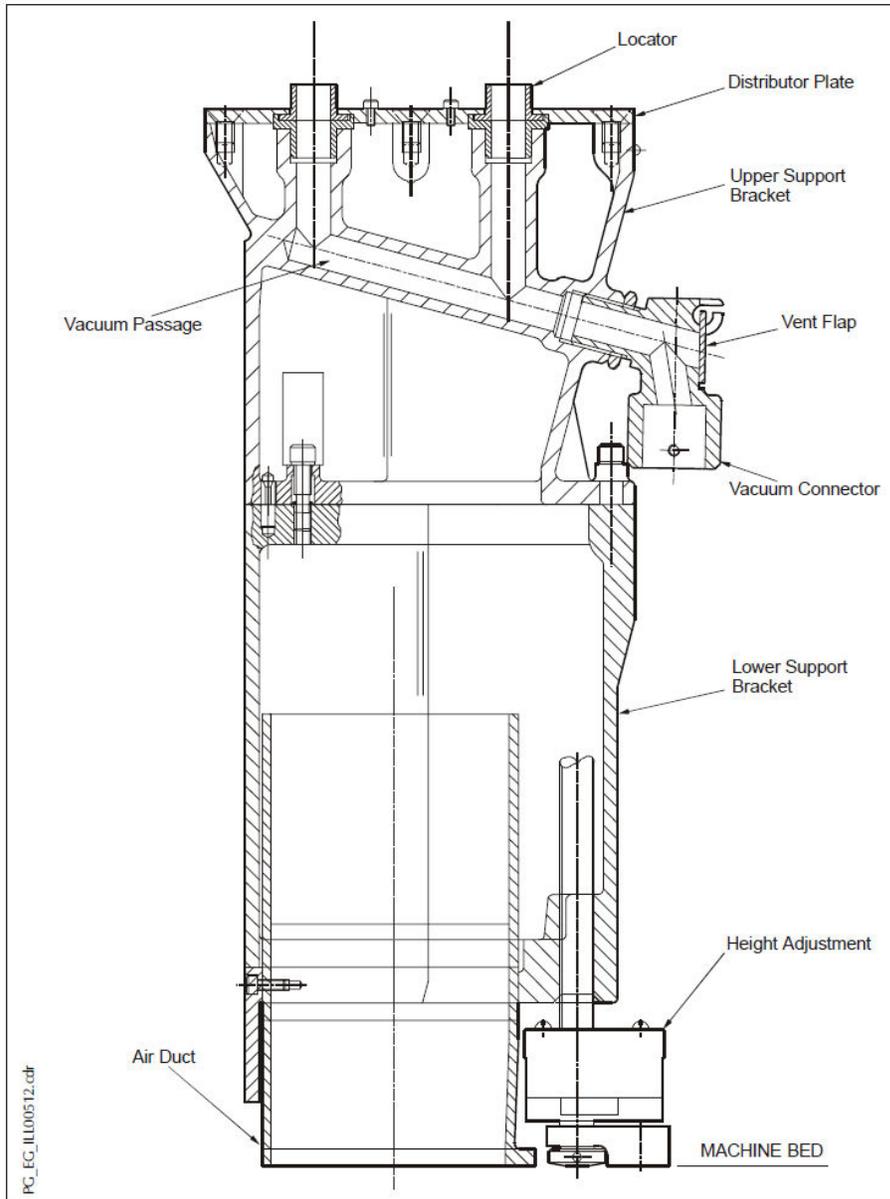


Fig.1 Blow Mold Cooling Mechanism

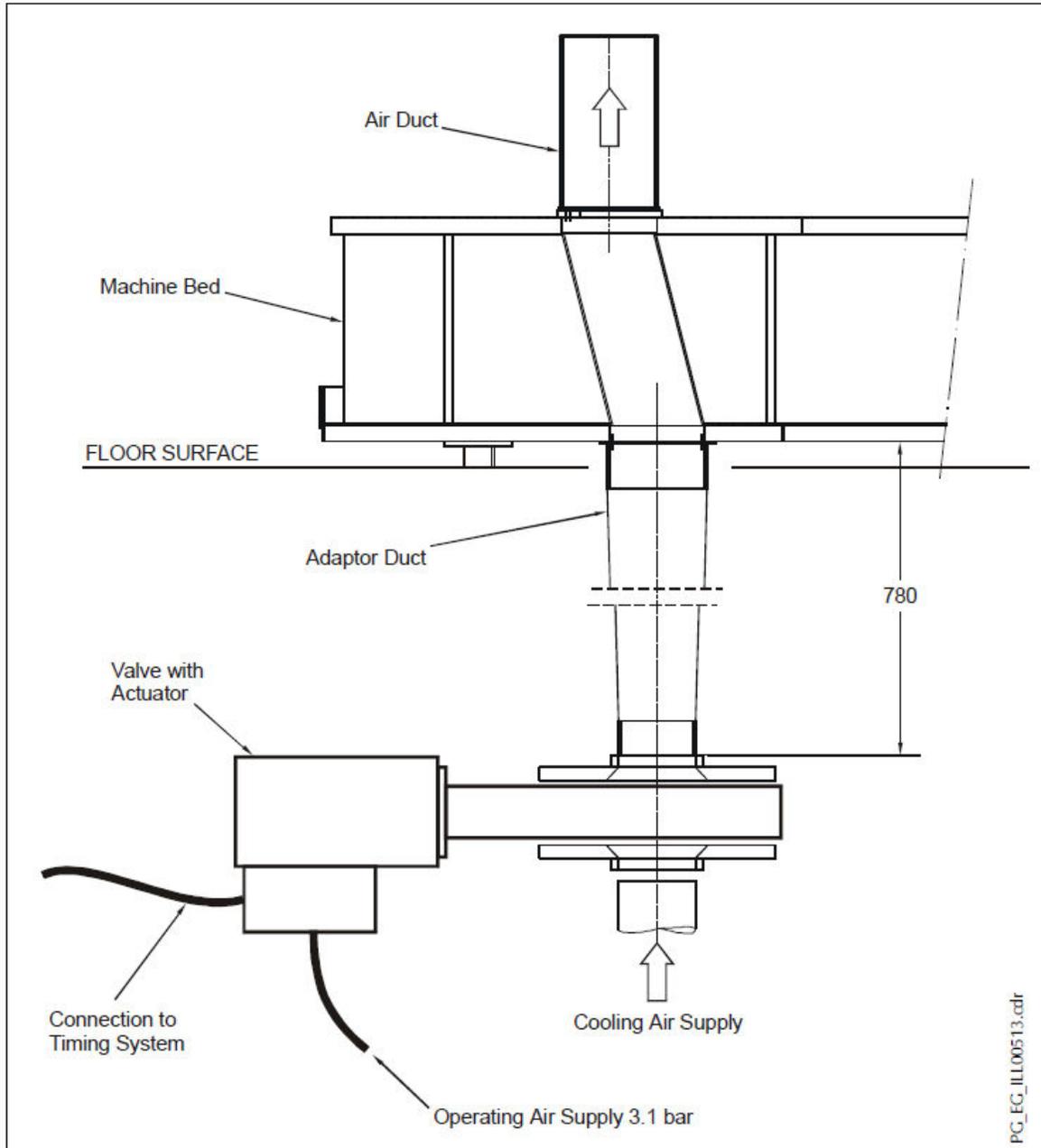


Fig.2 Cooling Air Supply

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3. Specification

The chart below gives the part numbers of the mechanism assemblies and the adjustment ranges which can be utilised.

Mechanism		Adjustment Range Invert to Top of Distributor Plate				
Center Distance	Part Number	Basic Mechanism		With Extension		Extension Part No.
		Maximum	Minimum	Maximum	Minimum	
SG 4 ¼	200-432-1	232	85*	Not required		191-9248-5
SG 5"	200-425-1	232	85*	Not required		191-9248-5
SG 5 ½	210-332-1	271	110*	Not required		191-9248-5
SG 6 ¼	210-336-1	271	110*	Not required		191-9248-5
DG 4 ¼	200-430-1	246	90	205	59*	191-9248-1
DG 5"	200-423-1	246	81	Not required		191-9248-2
DG 5 ½	210-330-1	252	100	211	73*	191-9248-3
DG 6 ¼	210-334-1	252	93*	Not required		191-9248-4
TG 3"	200-434-1	230	68*	Not required		191-9248-6
TG 85	200-370-1	192	84*	Not required		NA
TG 4 ¼	210-338-1	242	93*	Not required		191-9248-7

Notes:

The specified minimum values marked with an asterisk (*) are to be observed to allow for approx. 5 mm minimum clearance between the underside of the blow mold holder arm and the top of the mechanism.

The Support Bracket Extensions specified are not necessarily required. However, when producing short containers and approaching the minimum adjustment range it is recommended to use the extension for improved guiding of the mechanism in the section frame receiver.

4. Cooling Air Requirement

The cooling air requirement greatly depends on the ware being produced number of cooling holes in the mold and the cooling time. Tabulated below is the maximum theoretical cooling air throughput per mechanism under the following condition:

- cooling air pressure in the mechanism 1'000 mm WG.
- cooling time 200 degrees of the 360 degree cycle time.
- double row of cooling holes, where applicable.
- maximum cooling hole diameters.
- no mold equipment mounted on mechanism.

Mechanism Type	Cooling Air Nm ³ /min.
Single Gob	20
DG 4 ¼	17
DG 5"	23
DG 5 ½	26
DG 6 ¼	31
TG 3"	9
TG 85	9
TG 4 ¼	23

The actual cooling air throughput will be lower than indicated due to the flow resistance of the cooling holes. However, considerations must be made for system air losses.

5. Features and Benefits

- Individual cooling air pressure for blank and blow mold cooling is possible.
- Less mold surface temperature variation.
- Simple, maintenance friendly design.
- Upper support brackets interchangeable with Series 9700 mechanisms.