

WARRANTY FOR CHILLED BEAMS

PROJECT NAME:

POLICY EFFECTIVE DATE

WARRANTY DURATION 12 Months

CUSTOMER _____

ORDER No _____

Frenger undertakes to supply the customer with either repair and / or replacement chilled beam components to a technically equivalent performance standard to replace those items previously supplied by Frenger under the above listed purchase order, where the detailed chilled beam waterways are shown to exhibit water leakage. The cost of installation of replacement beams and removal/disposal of faulty beams to be borne by the customer. The warranty will only be valid if the following conditions are met.

Services system and water quality

The chilled water system should be filled using potable water which complies with the “EC Directive relating to the Quality of Water intended for Human Consumption 98/83/EC”; in area’s where the water is particularly “soft” with the PH towards the acidic side of neutral the water hardness must also be increased. Note hard waters may be softened to avoid excessive scale within the system however care must be taken as softened water is almost always more aggressive than raw water; should water softening be employed the minimum total hardness must be kept to a minimum of 60 ppm of CaCO₃.

The additional water specification requirements required for chilled water above that of normal potable water (see above) are detailed in the following table:

Variable	Acceptable Range / Maximum Concentration
pH	6-9
Oxygen Content*	< 1 ml/l
Water Velocity	≤ 1.0 m/s

- Note: The Oxygen content must be kept stable at a value less than 1 ml/l as minor increases in Oxygen (e.g. an increase from 0.5 to 1 ml/l) will be detrimental to the system and therefore void any warranty.

Any additive inhibitors / chemical treatments to help reduce oxygen content, microbiological contamination, scaling and prevent corrosion must be appropriate to use with copper and solder. It must be noted that any water treatment must be maintained within the inhibitor manufacturers specified control parameters as excess inhibitors can be as detrimental as too little.

Frenger Systems Limited	1 of 2			TDS36W(C)
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Derby, DE24 8HY, United Kingdom	+44 (0) 1332 295 678	+44 (0) 1332 381 054	3064484	www.frenger.co.uk

In order to ensure that the correct oxygen levels are maintained at the required level (less than 1 ml/l) without any increase and to ensure fouling due to debris does not occur within the chilled beam the following points should be noted:

- If plastic pipe is to be utilised on the installation the pipe must be manufactured with a 100% oxygen barrier (usually aluminium is bonded between the two walls of the plastic pipe).
- Expansion vessel membranes must be charged using nitrogen gas.
- In-line strainers must be used to remove particles from the chilled water and prevent debris from forming in the chilled beam.

Note: Any debris/particulates that either encourage bacteria growth or cause restriction will invalidate the chilled beam warranty.

Water Evaluation

The customer should ensure that the correct water quality is maintained at all times; it is recommended that water quality is monitored and recorded bi weekly for the first 2 months of system start, then monitored every 4 months and recorded subject to the water systems stability (all copies of water quality readings are to be forwarded to Frenger to keep on record). Note: Where extended warranties have been agreed beyond the standard 12 months would require an annual issue of the recorded water quality readings to be sent to Frenger.

Maintenance and Cleaning

A visual inspection of all product surfaces and connections is to be made by the customer on an annual basis. The inspection is to comment on the condition of all chilled beam connections, elbows and loops at the same time a full report of this inspection to be submitted to Frenger for evaluation for extended warranties.

All chilled beams are to be cleaned with a damp cloth to remove dust and debris to prevent any build-up that could impinge upon the chilled beam's cooling capacity. The anticipated frequency for cleaning is normally 2-3 years, albeit the required frequency will be dependant on project specific parameters and should therefore be determined by maintenance personnel during the annual inspections.

Guidelines For Installation

Installation to be made in accordance with Frenger's guidelines and O&M requirements; the units are designed for use within a controlled internal environment, hence any corrosion or paintwork defects caused by exposure to extreme environmental parameters (such as high humidity) or exposure to corrosive elements will not be covered by this warranty.

Connect the units using flexible connections with enough slack to take up expansion forces.

Connect water using the supplied copper inserts with compression coupling or similar.

Do not solder to the copper pipe tails.

Do not lift the product from the copper pipe tails.

Failure to meet the conditions as set out above may be considered a breach of the warranty, and may at Frenger's absolute discretion invalidate this warranty. This warranty is non-transferable.

**Signed on behalf of Frenger Systems Ltd
(United Kingdom)**

(signature)

Name: Andrew J Gaskell *B.Eng (Hons).*
AMIMechE
Position: Technical Director

Date: _____

Signed on behalf of Customer

(signature)

Name:
Position:

Date: _____

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