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KD

Kardburn and Koldburn Glass Door
Burn-in, Stress Screening, & Medical Storage Chambers

Description:

Supervise the operation of your electronic device, circuit board, or medical device while they are burned-in or temperature cycled inside a Bemco Kardburn or Koldburn glass front chamber.

Monitor the status of valuable temperature sensitive medical or commercial products while they are precisely conditioned in a Bemco KDM Glass Door Storage Chamber.

With a huge amount of testing or storage space within instant reach, KD Chambers provide a compact alternative to a walk-in chamber.

Glass door chambers were originally pioneered by Bemco over 25 years ago. Available in cart loaded, shelf loaded, relay rack mounted, and electronically fixtured versions, these chambers are still the standard by which all other glass door chambers are measured.

Why settle for the appearance of testing when you can have a system that actually works?

Choose Bemco, the pioneers in Glass Front Temperature Chambers.

Environmental Test and Space Simulation Systems



Pre-loaded and electronically fixtured carts are easily rolled into a Bemco KDL, Burn-in or Rapid Temperature Cycling Chamber.



Bemco Inc.
Focused on Excellence

Contact us for a free quotation or additional information.

Bemco Inc, since 1951

Glass Door Burn-in and Stress Screening Chambers



Bemco KDR4-20/65C Burn-in Chamber shown with optional burn-in power supplies and locally mounted refrigeration system.

KDR Koldburn and Kardburn Chambers

Very efficiently packaged to take an absolute minimum of valuable floor space and available in one to six bay versions, Bemco KDR Series Koldburn chambers are optimized for temperature cycling and burn-in of electronic devices and electronic circuit boards.

Designated a model KDR Kardburn when circuit board card cages furnished by Bemco are specified, these chambers use specially fabricated temperature controlled heated frame doors with conductively heated multi-pane glass windows to allow individual bay access to items under test.



The exterior equipment and the control apparatus are neatly packaged in a sheet metal enclosure painted Bemco Blue or optionally from 300 Series stainless steel so that they can be flush mounted through a wall or aligned with a narrow walkway. The rear mounted vertical air duct is constructed so that a large number of optional penetrations can be installed in the rear wall for fixturing.

Similar in concept to the familiar reach-in cooler found in supermarkets, these chambers are much easier to load than a walk-in. The large glass doors help you watch your displays, lights, and switches while keeping track of test progress and observing

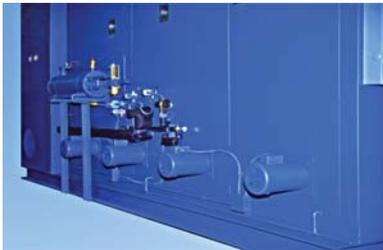
potential problems before they become serious.

Conditioning

Each bay includes a high volume, non-sparking, aluminum blower drawing air through a large, bottom of bay mounted, cooling coil and an electric air heating system. The blower discharges into a rear mounted duct that flows air up the back wall to a ceiling mounted diffuser.

The high volume air circulation system assures temperature uniformity over the items being tested and helps eliminate hot spots. An oversize shaft, dual ball bearing race, TEFC motor mounted outside the workspace on the chamber back wall drives the blower.

A proportionally controlled, water cooled refrigeration system utilizing modern, environmentally friendly refrigerants cools the workspace. This system is furnished as a packaged unit for remote mounting by your refrigeration contractor. Air cooled refrigeration systems and



Bemco KDR4-20/65C fan motors and a water cooled condenser extend from the rear of the chamber and add approximately 12-inches to overall depth.



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We Deliver

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Glass Door

Burn-in and Stress Screening Chambers



KDR Glass Door, Common Bay Chambers										
Model Number	Temperature Range Maximum	Bays	Workspace			Overall Dimensions			Airflow Pattern	Airflow Type
			Height	Width	Depth	Height	Width	Depth		
KDR1 ⁽³⁾⁽⁴⁾	-20 to 65 C	1	61"	31.8"	28"	101"	69.8"	42"	Vertical	Ducted, TB ⁽⁶⁾
KDR2 ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	-20 to 65 C	2	61"	62.2"	28"	101"	100.5"	42"	Vertical	Ducted, TB ⁽⁶⁾
KDR3 ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	-20 to 65 C	3	61"	92.7"	28"	101"	130.7"	42"	Vertical	Ducted TB ⁽⁶⁾
KDR4 ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	-20 to 65 C	4	61"	123.1"	28"	101"	161.1"	42"	Vertical	Ducted TB ⁽⁶⁾
KDR5 ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	-20 to 65 C	5	61"	153.6"	28"	101"	191.6"	42"	Vertical	Ducted TB ⁽⁶⁾
KDR6 ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	-20 to 65 C	6	61"	185.1"	28"	101"	223.1"	42"	Vertical	Ducted TB ⁽⁶⁾

⁽¹⁾ Overall width given includes a 30" wide machinery compartment and remote refrigeration system package.
⁽²⁾ Common system with one refrigeration system, one temperature control, and one heating system for all bays.
⁽³⁾ No separating bay walls. All bays are connected in common. Allow 12" extra depth for fan motors at rear.
⁽⁴⁾ Glass doors are connected by a common frame, are in-fitting, and include self closing springs and magnetic gaskets.
⁽⁵⁾ Each bay door has a clear open loading area through the door of 27-1/2" wide by 64-1/4" high. Applies to all models.
⁽⁶⁾ Ducted TB Airflow includes a large bottom mounted cooling coil, rear vertical duct, and a top air distribution baffle.

KDR Koldburn and Kardburn Chambers

integrally mounted and enclosed re- refrigeration systems are also option- ally available.

Fast response, low watt density open type heaters located behind a radiation baffle raise chamber temperature as required. The heat- ers are protected by a factory preset high temperature safety thermostat interlocked with a separate power interrupting contactor.

Chamber Interior

Kardburn and Koldburn chambers include a heliarc welded 304 series stainless steel inner liner with high temperature fiberglass insulation. No asbestos is used in chamber construction. Duct-work and baffles are also fabricated from 300 series stainless steel.

Controls

The KDR Chamber includes a mi- croprocessor based programmable 1/4-DIN solid state 256-step ramp- ing temperature controller with a 4-line LCD display and a large red LED readout.

An RS232 and RS485 interface is standard. The protocol is Modbus™. LabVIEW™ drivers are available.

A Factory Mutual approved high and low temperature safety control with audible and visual alarm is optionally available.

Performance

Standard KDR chambers include a 1500 cfm air circulation system in each bay. They heat from 0 C to 65 C in approximately 60 minutes when

loaded with a test load equivalent to 115 pounds of aluminum per bay plus 3 shelves. They cool from 65 C to 0 C in approximately 30 minutes with 115 pounds of aluminum per bay plus 3 shelves while the load dissipates 500 watts per bay.

A standard higher performance conditioning system (add -HC to the model number requested) has the same performance on cooling and heating as the base system with a load of 230 pounds of aluminum per



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Glass Door Burn-in and Stress Screening Chambers



KDR Koldburn and Kardburn Chambers

bay plus 3 shelves dissipating 1000 watts of heat while cooling.

Custom conditioning systems with much faster heating and cooling rates and higher live load capabilities are available.

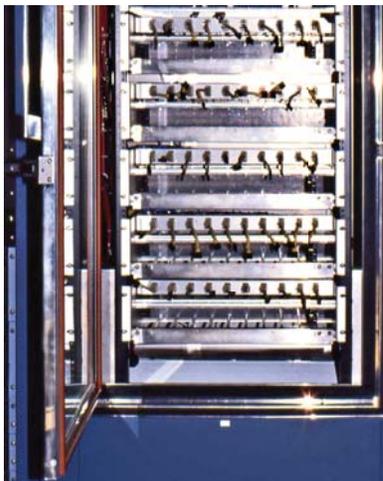
Temperature Control is + or - 1 C guaranteed, + or - 0.25 C typical.

All electrical wiring meets the United States National Electric Code. U.L. and CSA approved components are used where possible.

Optional Accessories

These systems are designed for custom-tailoring to specific testing needs. Some of the common accessories specified include:

- Access Ports. Sizes are 2", 3", 4" and 6." One 3" access port in the left wall is provided with each chamber.



- Shelf pilasters
- Card cages matching your circuit boards.
- Wire-type stainless steel shelves.
- Wire type epoxy coated shelving systems.
- LN2 boost cooling with vent for extra or back-up cooling.
- GN2 gas purge with pressure regulator, gauge, flow measuring and regulating valved rotameter, and vent.
- Desiccant Drier purge with dual tower 10 cfm desiccant drier, pressure regulator, gauge, flow measuring and regulating valved rotameter, and vent.
- Burn-in power supplies with distribution buss bars, sequencing, or monitoring electronics.
- Distribution circuit boards with product pendants.
- Test termination cable boxes and connectors.
- High life and high current connector arrays.
- Insulated wall feed-throughs and extender boards.
- Electronic product load boards.
- Stainless steel exterior construction.

Optional Instruments

- Microprocessor-based, FM Approved high and low temperature safety controls.
- 12 inch chart printing, circular recorder.



- Single pen or multi-pen strip chart recorders.
- Programmable logic control of test processes. Bemco recommends Allen Bradley (ABB) PLC's and software.
- Touchscreen HMI's (human machine interfaces).



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Glass Door

Individual Bay, Stress Screening Chambers



KDZ Glass Door, Individual Bay Chambers										
Model Number	Temperature Range Maximum	Bays	Workspace			Overall Dimensions			Airflow Pattern	Airflow Type
			Height	Width	Depth	Height	Width	Depth		
KDZ1 ⁽⁴⁾	-20 to 94 C	1	41.2"	24" x1	38"	82.2"	36"	63.7"	Vertical	Ducted, TB ⁽⁶⁾
KDZ2 ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	-20 to 94 C	2	41.2"	24" x2	38"	82.2"	78"	63.7"	Vertical	Ducted, TB ⁽⁶⁾
KDZ3 ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	-20 to 94 C	3	41.2"	24" x3	38"	82.2"	120"	63.7"	Vertical	Ducted TB ⁽⁶⁾
KDZ4 ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	-20 to 94 C	4	41.2"	24" x4	38"	82.2"	162"	63.7"	Vertical	Ducted TB ⁽⁶⁾

⁽¹⁾ Overall width given includes a 6" separator ring between compartments and remote refrigeration system packages.
⁽²⁾ Individual system with one refrigeration system, one temperature control, and one heating system for each bay.
⁽³⁾ Each bay includes individual side separating walls. Bays are not connected in common and can be run individually.
⁽⁴⁾ Glass doors are of the overlapping type and each includes a dual latch and connecting bar release.
⁽⁵⁾ Each bay door has a clear door opening of 24" wide by 41.2" high. The 24" width is reduced by the strut support system.
⁽⁶⁾ Ducted TB Airflow includes a large bottom mounted cooling coil, rear vertical duct, and a top air distribution baffle.

KDZ Wide Range Individual Bay Chambers

The Bemco KDZ is similar to the Bemco Kardburn KDR except it has a wider temperature range, a built-in product support system, a latched glass door with a compression gasket, and every bay has its own independent conditioning system, refrigeration package, heaters, and controls.

Each bay can be individually loaded without affecting its neighbor. When more than one bay is specified, a 6 inch wide ring separator is furnished with internal vent fans. This separator ring isolates each bay preventing thermal cross-talk. KDZ chambers are more compact than KDR chambers. They are designed to be moved singly by bay and then assembled as a group on site.

Built-in Supports

Each bay is furnished with a built-in universal 1-1/2 inch T Slot anodized

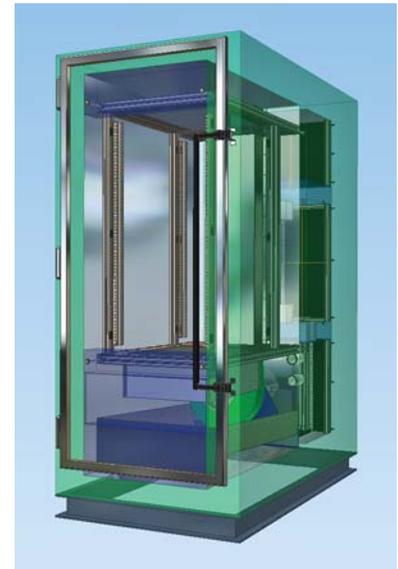
aluminum forward and back strut frame to allow easy installation of complex product support structures, shelves, or relay rack rails. When rack rails are installed, the struts are aligned so that standard 19 inch panels fit conveniently. Clearance between the side rails is 20-7/8". Shelves, when specified, are 20 inches wide by 36 inches deep. Support rails are set back 5-3/4" from the chamber face and the front and back rails are 24-1/2" apart.

Remote Refrigeration

All KDZ models are furnished with air cooled or water cooled independent mechanical refrigeration systems packaged for outdoor installation. Every bay has its own refrigeration system.

Control Console

A 19" relay rack console, 24" wide by 30" deep, is standard with every



system. Up to eight bays can be controlled from a single console.

KDZ Options

All of the Options previously described for the KDR series are also available on the KDZ.



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We Deliver

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Glass Door Individual Bay Cart Loaded Chambers



KDL Cart Loaded Stress Screening Chambers										
Model Number	Temperature Range Maximum	Bays	Workspace			Overall Dimensions			Airflow Pattern	Airflow Type
			Height	Width	Depth	Height	Width	Depth		
KDL1 ⁽⁴⁾	-20 to 94 C	1	68"	48" x1	50"	88.1"	86" ⁽¹⁾	94.5"	Vertical	Ducted, TB ⁽⁶⁾
KDL2 ⁽²⁾⁽³⁾⁽⁴⁾	-20 to 94 C	2	68"	48" x2	50"	88.1"	142" ⁽¹⁾	94.5"	Vertical	Ducted, TB ⁽⁶⁾

⁽¹⁾ Overall width given includes a 30" wide control console.
⁽²⁾ Individual system with one refrigeration system, one temperature control, and one heating system for each bay.
⁽³⁾ Each bay includes individual side separating walls . Bays are not connected in common and can be run individually.
⁽⁴⁾ Glass doors are of the overlapping type and each includes a dual latch and connecting bar release.
⁽⁵⁾ Each Bay door has a clear open loading area through the door of 48" wide by 68" high.
⁽⁶⁾ Ducted TB Airflow includes a bottom mounted under cart suction duct, rear conditioning, and a top air distribution baffle.

KDL Glass Door Cart Loaded Chambers

The Bemco KDL series is designed for production testing of electronic circuit boards and completed electronic systems. They accept Bemco KDLC Carts that have a working area of 42" wide by 60" high by 48" deep suspended on insulated runners and casters 11 inches above the test area floor.

KDLC Carts are available as shelf carriers with four stacks of 20" x 20" wire type shelves, adjustable on 3/4" increments, or as card cage carriers that support four stacks of standard 19" relay rack style card cages.

Custom carts, connectors, load boards, card cages, connector arrays, bus bars, and fixturing systems optimized to match your specific requirements are available.

Construction

A picture of a KDL chamber is shown on the front cover of this bulletin. In the same manner as the KDR Koldburn chambers, the

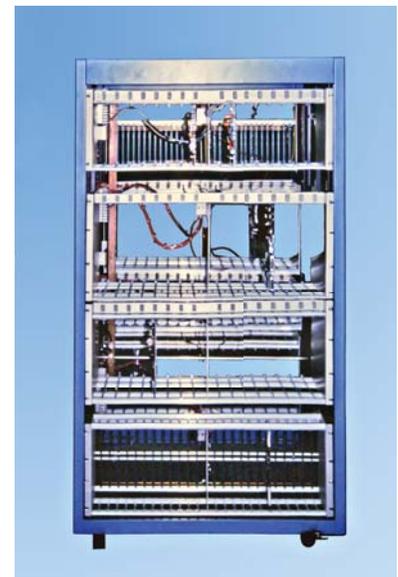
KDL Cart loaded chamber uses a specially fabricated temperature controlled heated frame door with a conductively heated multi-pane glass window to allow convenient access to the KDLC Cart.

The exterior equipment and the control apparatus are neatly packaged in a centrally mounted and rear mounted sheet metal enclosure painted Bemco Blue or optionally fabricated from 300 Series stainless steel so that they can be flush mounted through a wall or aligned with a narrow walkway.

Conditioning

Each bay includes two high volume, non-sparking, aluminum blowers drawing air through a large tongue like baffle beneath the KDLC Cart. Air from the baffle is drawn through a rear mounted refrigerated heat exchanger, heaters, the two blowers, and then discharged into a top supply baffle to evenly distribute air through the KDLC Cart.

High volume air flow assures temperature uniformity over the items being tested and helps eliminate hot spots. Two oversize shaft, dual ball bearing race, TEFC motors mounted outside the workspace on the chamber top drive the blowers. Please note that chamber height is increased by approximately 12" in



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Glass Door

Individual Bay Cart Loaded Chambers



KDL Glass Door Cart Loaded Chambers

the top area where the two fan motors are located.

A proportionally controlled water cooled refrigeration system utilizing modern, environmentally friendly, refrigerants is supplied for each bay to cool the workspace.

These systems are furnished as a packaged unit for remote mounting by your refrigeration contractor. Air cooled refrigeration systems and integrally mounted and enclosed systems are also optionally available.

Fast response, low watt density open type heaters located behind a radiation baffle raise chamber temperature as required. The heaters are protected by a factory preset high temperature safety thermostat interlocked with a separate power interrupting contactor.

Chamber Interior

KDL chambers include a heliarc welded, 304 series, stainless steel inner liner with high temperature fiberglass insulation. No asbestos is used in chamber construction. Duct-work and baffles are also fabricated from 300 series stainless steel.

Controls

The KDL Chamber includes a micro-processor based programmable 1/4-DIN solid state 256-step ramping temperature controller with a 4-line LCD display and a large red LED readout for each bay.

An RS232 and RS485 interface are standard. The protocol is Modbus™. LabVIEW™ drivers are available.

A Factory Mutual Approved high and low temperature safety control with audible and visual alarm is optionally available.

Performance

Standard KDL chambers include a 3000 cfm air circulation system in each bay. They heat from 0 C to 85 C at an average rate of 5 C per minute when loaded with a KDLC Cart and a test load equivalent to 500 pounds of aluminum per bay including fixturing. They cool from 85 C to 0 C in at an average rate of 5 C per minute with 500 pounds of aluminum per bay while the load dissipates 2000 watts per bay.

Larger conditioning systems and much faster heating and cooling rates as well as higher live load holding capabilities are available.

Temperature Control is + or - 1 C guaranteed, + or - 0.25 C typical.

All electrical wiring meets the United States National Electric Code. U.L. and CSA approved components are used where possible.

Optional Accessories

These systems are designed for custom-tailoring to specific test-

ing needs. Some of the common accessories specified include:

- LN2 boost cooling with vent for extra or back-up cooling.
- GN2 gas purge with pressure regulator, gauge, flow measuring and regulating valved rotameter and vent.
- Desiccant Drier purge with dual tower 10 cfm desiccant drier, pressure regulator, gauge, flow measuring and regulating valved rotameter and vent.
- Burn-in power supplies with distribution buss bars, power sequencing, or monitoring electronics.
- Bemco factory fixtured KDLC carts optimized for a specific product or process.
- Automatic cart connector arrays.
- Stainless steel exterior construction.

Optional Instruments

All of the instrument options described for the KBR Series, previously described, are available.



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Glass Door Medical Storage Chambers

KD

Environmental Test and Space Simulation Systems

KDM Glass Door, Common Bay, Medical Storage Chambers

Model Number	Temperature Range Maximum	Bays	Workspace			Overall Dimensions			Airflow Pattern	Airflow Type
			Height	Width	Depth	Height	Width	Depth		
KDM1 ⁽⁴⁾	-20 to 65 C	1	64.5"	31.8"	31"	81"	75.8"	38"	Circular	Top Mounted ⁽⁶⁾
KDM2 ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	-20 to 65 C	2	64.5"	62.2"	31"	81"	106.3"	38"	Circular	Top Mounted ⁽⁶⁾
KDM3 ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	-20 to 65 C	3	64.5"	92.7"	31"	81"	136.7"	38"	Circular	Top Mounted ⁽⁶⁾
KDM4 ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	-20 to 65 C	4	64.5"	123.1"	31"	81"	167.1"	38"	Circular	Top Mounted ⁽⁶⁾
KDM5 ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	-20 to 65 C	5	64.5"	153.6"	31"	81"	197.6"	38"	Circular	Top Mounted ⁽⁶⁾
KDM6 ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	-20 to 65 C	6	64.5"	185.1"	31"	81"	229.1"	38"	Circular	Top Mounted ⁽⁶⁾

- ⁽¹⁾ Overall width given includes a 36" wide machinery compartment and a local air cooled refrigeration system package.
- ⁽²⁾ Common system with one refrigeration system, one temperature control, and one heating system for all bays.
- ⁽³⁾ No separating bay walls. All bays are connected in common. Pilasters for mounting shelves are standard.
- ⁽⁴⁾ Glass doors are connected by a common frame, are in-fitting, and include self closing springs and magnetic gaskets.
- ⁽⁵⁾ Each bay door has a clear open loading area through the door of 27-1/2" wide by 64-1/4" high.
- ⁽⁶⁾ Air is drawn in at the center of the chamber top and discharged down both the front door and rear walls towards the floor.

KDM Medical Storage Chambers

The Bemco KDM is similar to the Bemco Koldburn KDR already described in this bulletin except it has a circular air flow conditioning system located on the chamber ceiling, is optimized for shelf supported and temperature controlled storage of valuable pharmaceutical products or medical devices, and comes standard with a high temperature alarm system, a 12" circular chart recorder, and a microprocessor based programmable 1/4-DIN solid state 256-step ramping temperature controller with a 4-line LCD display and a large red LED readout. An RS232 and RS485 interface are standard. The protocol is Modbus™. LabVIEW™ drivers are available.

Commonly keyed door locks are included. Electronic solenoid driven locking pins with a code release pad and battery backed, door open sensors with a remote contact closure are optionally available.

A replaceable HEPA filter with a differential pressure alarm is offered as an option. This modification increases overall height by 10" and is installed on 2, 4, and 6 bay units only. When selected, the air flow pattern is modified to a two bay system to accommodate the filter.

The KDM Chamber includes a proportionally controlled, air cooled refrigeration system utilizing modern, environ-

mentally friendly refrigerants. When specified, electric heaters, heat the workspace.

All KDR accessories are available. The most popular selection is all stainless steel construction.



Excellence



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