

Imagine the Possibilities



Retaining Excellence



Where Excellence is the Standard

For almost two decades, Keystone Retaining Wall Systems has set the bar for excellence, innovation, and technology within the industry. Keystone represents the world-wide standard in soil retention, erosion control, and landscape systems. As the industry leader, Keystone has always been a product of the energy, passion, and focus of the people that

promote it. Keystone works with the best network of manufacturers, product developers, engineers, and sales professionals in the business. They ensure that Keystone products and services offer the best site solutions for residential, commercial, recreational, industrial, and governmental applications.



Uniquely Keystone



Offering a broad family of products, Keystone has the right solution to meet the most challenging structural and landscape sites. Keystone also leads the marketplace in segmental retaining wall performance and aesthetics.

- ▶ The original Keystone Standard unit provides the most stable construction platform in the industry for taller gravity walls.
- ▶ Keystone Compac units offer the best mix of cost effectiveness, aesthetics and performance.
- ▶ Keystone Country Manor was developed for projects where aesthetic considerations are paramount.
- ▶ Keystone Century Wall provides the aesthetic multi-size units while providing the same structural integrity as Compac Units.

The Keystone difference lies in its outer beauty and inner strength. Keystone's patented, interlocking, fiberglass pin system ensures a positive connection between the structural wall unit and the soil reinforcement. Keystone's patented pins also aid in precise alignment, making it easy to create any unique wall design.

With over 18 years of retaining wall design experience, Keystone is the most widely available retaining wall system on the market and is manufactured nationally in most major cities and internationally in over 35 locations.

*Every great invention
is the result of
finding a solution to
a problem or need!*



Keystone's Family of Products

KEYSTONE STANDARD UNIT - SERIES I & II

The Keystone Standard is an American original and remains the industry leader. Its height-to-depth ratio delivers a structurally sound, engineered wall system with superior construction stability, durability, and strength. This product is the preferred choice for tall walls and critical structures.



* Size:

- Series I - 8"h x 18"w x 21 1/2"d (200 x 450 x 550 mm)
- Series II - 8"h x 18"w x 18"d (200 x 450 x 450 mm)

Exposed Face Area:

- 1 sq. ft. - 8" x 18"

* Weight:

- 105 lbs. (50 kg)



KEY FEATURES

High Strength Pin Connection System

Open Cores

- ▶ Increase vertical drainage through the face units.
- ▶ Allow for gravel interlock across block interfaces.
- ▶ Improve connection strength between face units and geogrid.
- ▶ Improve unit-to-unit shear resistance.

Versatility

- ▶ Sculptured (tri-planar) or straight face options provide stunning aesthetics. Additional texture and shape options are available in selected markets.
- ▶ Near vertical or battered setback options are available.

Shape

- ▶ Tapered sides offer ease in constructing radii as tight as 5 feet.
- ▶ Unit shape has a "tail element" at the rear of the unit for ease in handling.
- ▶ Unit tails can be interlocked, increasing the base width and the height that gravity walls can be constructed.
- ▶ Cores allow placement of handrail or fence posts to be incorporated into the wall.

Greater Unit Depth & Increased Mass

- ▶ Large units allow at least a 50% increase in overturning resistance.
- ▶ Allows taller gravity walls.
- ▶ Pins and greater unit depth results in increased unit-to-unit and unit-to-geogrid strength.
- ▶ Significantly improves construction stability, minimizing face movement and alignment problems.
- ▶ Allows increased vertical spacing between reinforcing layer for more efficient distribution and improved engineering results.



*Note: Unit colors, dimensions, weight, and availability may vary by manufacturer.

KEYSTONE COMPAC UNIT - SERIES I & II

The Keystone Compac is the perfect choice when the deep embedment length of the Keystone Standard unit is not required. An installer's favorite, its lighter weight and shorter tail design make it easy to handle.



*** Size:**

- 8"h x 18"w x 12"d (200 x 450 x 300 mm)

Exposed Face Area:

- 1 sq. ft. - 8" x 18"

*** Weight:**

- 85 lbs. (39 kg)



KEY FEATURES

High Strength Pin Connection System

Open Cores

- ▶ Increase vertical drainage through the face units.
- ▶ Allow for gravel interlock across block interfaces.
- ▶ Improve connection strength between face units and geogrid.
- ▶ Improve unit-to-unit shear resistance.
- ▶ Series II version has a larger core area for rapid filling with drainage material.

Versatility

- ▶ Sculptured (tri-planar) or straight face options are shown. Additional options are available in selected markets.
- ▶ Weathered or "antiqued" finish options are available in select markets.
- ▶ Near vertical or battered setback options are available.

Shape

- ▶ Tapered sides allow ease in constructing radii as tight as 4.5 feet.
- ▶ Unit shape has a "tail element" at the rear of the unit for ease in handling.
- ▶ Triangular pin connection hole allows for builder-friendly construction adjustments.

*Note: Unit colors, dimensions, weight, and availability may vary by manufacturer.

Keystone's Family of Products

KEYSTONE COUNTRY MANOR®

Random and rugged, yet blended with color and character, these high strength concrete modules appear as natural stone, but have the latest built-in technology of the Keystone pin assured connection.



"Old World Charm"

6"h x 10"d x 16"/14"w
(150 x 250 x 400/350mm)
60 lbs. (27 kg)



6"h x 10"d x 12"/12"w
(150 x 250 x 300/300mm)
45 lbs. (20 kg)
(Two smooth ends for vertical stack capability)



6"h x 10"d x 8"/10"w
(150 x 250 x 200/250mm)
45 lbs. (20 kg)



6"h x 10"d x 6"/8"w
(150 x 250 x 150/200mm)
35 lbs. (16 kg)



6"h x 10"d x 4"/6"w
(150 x 250 x 100/150mm)
25 lbs. (11 kg)



KEY FEATURES

Multiple Face Dimensions

- ▶ Provides the greatest degree of random layout due to variations from unit face dimensions.
- ▶ The 12"/12" unit has two smooth ends for vertical stack capability

Colors

- ▶ Keystone Country Manor is produced in color blends that enhance the natural stone-like appearance.

3 Textured Sides on Several Units

- ▶ Weathered or antiqued finish to provide a more natural stone look to the units.
- ▶ Allows each unit to be used in multiple positions within the wall.
- ▶ These units can be used as an exposed end unit or a 90° corner unit.
- ▶ Allows construction of small free-standing walls, parapet walls, pilasters and columns in addition to retaining walls.

Shape

- ▶ Each unit has a 90° angle and a tapered side, allowing them to be used in 90° corners, tight fitting straight line walls, and radii at curves.

Units are Packaged in Sets

- ▶ Eliminates the need for the contractor to pull from multiple pallets to maintain random appearance.
- ▶ Provides for a simple method of construction and a random appearance to the wall system.

High Strength Pins with Shouldered Cap

- ▶ Multiple pin positions allow for near vertical setback and an occasional forward protruding unit for a more random appearance.



KEYSTONE CAPPING UNITS

A Keystone wall is not complete without the “capping touch”!

KEYSTONE STRUCTURAL CAPPING UNITS



Compac Angle-sided
8"h x 10.5"d x 18"w
(200 x 265 x 455mm)
95 lbs. (43 kg)

Compac Straight-sided
8"h x 10.5"d x 18"w
(200 x 265 x 455mm)
100 lbs. (45 kg)

Mini Straight-sided
4"h x 10.5"d x 18"w
(100 x 265 x 455mm)
50 lbs. (23 kg)

KEYSTONE COUNTRY MANOR CAPPING UNITS



3"h x 12"d x 12"/12"w
(75 x 305 x 305/305mm)
35 lbs. (16 kg)

3"h x 12"d x 8"/10"w
(75 x 305 x 200/250mm)
30 lbs. (14 kg)

3"h x 12"d x 4"/6"w
(75 x 305 x 100/150mm)
15 lbs. (7 kg)

KEYSTONE STRUCTURAL CAPPING UNITS

KEY FEATURES

- ▶ Keystone Compac cap units are available in angle-sided or straight-sided options.
- ▶ Multiple cap thickness options (eight-inch or four-inch) allows for design flexibility.
- ▶ Caps are produced in the same colors and textures as the structural wall units, providing a seamless look and feel.

KEYSTONE COUNTRY MANOR CAPPING UNITS

KEY FEATURES

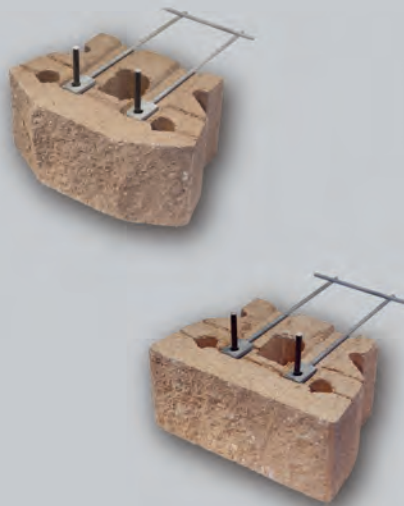
- ▶ Offered in three sizes, maintaining the hand-crafted, random look of the multi-piece Keystone Country Manor system.
- ▶ Produced in the same colors and textures as the Country Manor wall units, providing a seamless look and feel.
- ▶ Mixture of tapered and square cap units are great for either curved or straight walls.



Keystone's Family of Products

KEYSTONE KEYSYSTEM I™

The KeySystem I is specifically designed for use in the highway and heavy construction industries using the patented Keystone modular concrete units and inextensible steel reinforcement to develop a durable, aesthetically appealing, and cost effective reinforced soil retaining wall structure.



*Size:

- 8"h x 18"w x 12"d (200 x 450 x 300 mm)

Exposed Face Area:

- 1 sq. ft. - 8" x 18"

*Weight:

- 85 lbs. (39 kg)



KEY FEATURES

All of the features of Compac units plus the following:

Inextensible Steel Reinforcement

- ▶ Significantly reduced deflection or movement within the reinforced mass. Deflections with steel reinforcement are reduced by over 66% compared to geosynthetic reinforcement.
- ▶ Performance is not time dependent such as polymer creep effects with extensible reinforcing (geogrids).
- ▶ Backfill of up to 4" to 6" maximum size can be used. With geosynthetics, the maximum size is generally limited to approximately 3/4" due to erratic resistance and installation damage with larger particle sizes.

Designed to More Rigorous AASHTO Standards

- ▶ Increased factors of safety and confidence in wall system performance.

Intended for the Most Demanding Applications

- ▶ Deflection sensitive applications such as:
 - Bridge abutments
 - Tall walls
 - Walls with heavy surcharges
 - Walls where loads or structures bear on or immediately behind the reinforced mass
- ▶ Transportation or other projects requiring AASHTO compliance.
- ▶ HITEC Evaluation #40478



*Note: Unit colors, dimensions, weight, and availability may vary by manufacturer.

KEYSTONE FIBERGLASS PINS

The Keystone patented system features high strength, pultruded fiberglass pins that provide a true shear connector, geogrid proof positive holder, and an alignment device all in one piece.

- ▶ Maintains a positive mechanical connection between adjacent units and between units and geogrid.
- ▶ Easy alignment and simple construction procedure.
- ▶ With pin method, units maintain a running bond for aesthetics and structural integrity.
- ▶ Each unit is integrally connected with every other face unit.
- ▶ Holds the geogrid in place during construction when normal confining pressures are low.
- ▶ Provides a visible connection location and method for the installation contractor.
- ▶ Provides easy quality control inspection of proper geogrid placement.
- ▶ Pins are made of high strength pultruded fiberglass. They are strong in shear, durable, rust-proof, and are not negatively affected by temperature changes.



KEYSTONE LANDSCAPE UNITS

Along with the structural pinned systems, Keystone also offers a wide variety of landscape products used by contractors and homeowners for smaller wall applications. All landscape units are connected by a lipped connection and are recommended for lower wall heights. The landscape units shown below are a few of the units available. Contact your local Keystone representative or check out the web site at www.keystonewalls.com for availability in your market.



Endless Applications



GOVERNMENTAL

Keystone walls routinely provide site solutions in government projects. Government agencies that use Keystone products include:

- ▶ U.S. Federal Highway Administration
- ▶ State Department of Transportation Roadway and Freeway Projects
- ▶ Army Corps of Engineers
- ▶ Wide range of state D.O.T.s



INDUSTRIAL

Keystone stands up to the extreme heavy-loading conditions and high-traffic areas of industrial sites. In industrial applications, similar to the project shown at right, Keystone has taken on daily static loads of over 200 tons. Keystone also offers excellent design benefits for construction in areas of high seismic activity.

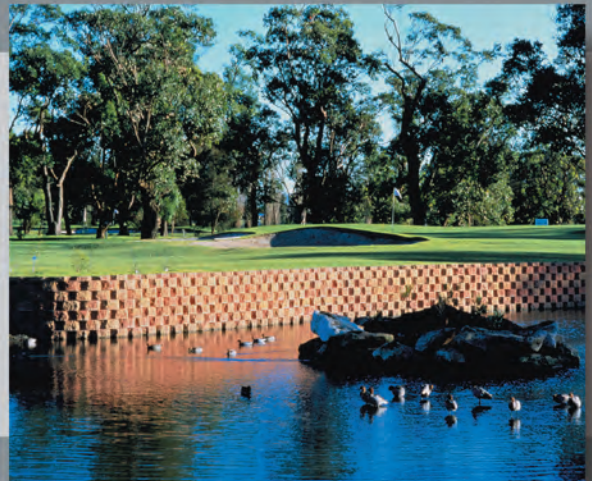


RECREATIONAL

Keystone provides superior durability with the ultimate in aesthetics for any recreational application.



- ▶ Golf Courses and Clubhouses
- ▶ Water Parks and Beachfronts
- ▶ Amphitheaters
- ▶ Skate Parks



COMMERCIAL

Keystone is a key player in land management and commercial expansion, creating buildable land for new construction or redevelopment. Keystone helps maximize the aesthetic value and “best use” of any property by blending with natural surroundings or complementing existing structures.



PUBLIC WORKS

Municipal administrators across the country choose Keystone for their public works projects. In schools, city offices, courthouses, libraries, police and fire stations, public pools, playgrounds, city parks, and more, Keystone products offer what city planners look for in site solutions – versatility, durability, and cost-savings.



RESIDENTIAL

Keystone offers a wide variety of residential landscape products to add to the property value of any home. Keystone provides a variety of unit sizes, colors, and texture options to complement or highlight any exterior landscape. Create a unique look to any outdoor living environment with Keystone.



The Many Faces of Keystone

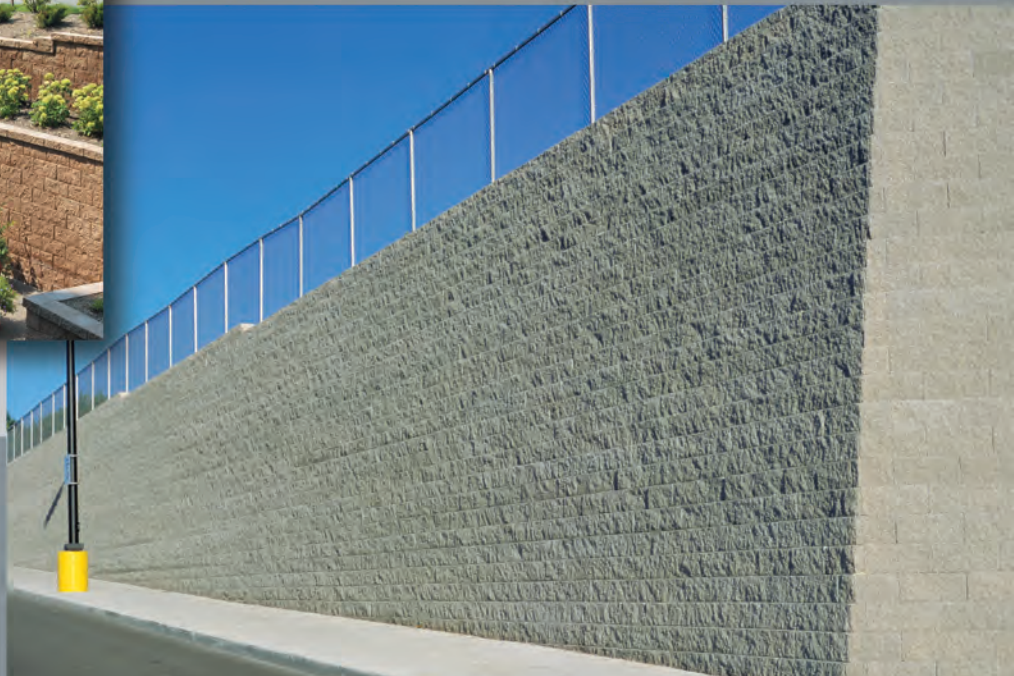
SCULPTURED ROCK FACE

Creates a natural stone look with rich texture and warm shadows.



STRAIGHT FACE

Creates a refined design with simple clean lines for a classic look.



A N T I Q U E D F A C E

Creates the appearance of classic,
hand-crafted stone.



C R E A T I V E F A C E S

Colors • Patterns • Veneering • Texture Combinations



Limitless Buildability

CURVES

Keystone products make it easy to construct a variety of serpentine curves. Convex and concave curves will add gentle grace and beauty to any installation. For walls with many concave curves, use the near vertical setback pin placement option for best results.



STEPS

Keystone products offer tremendous design flexibility and make an attractive option for residential step design. Steps and stairs can be customized to fit a variety of applications. No matter the state of a particular site, steps can be built without complication before, during, or after construction is complete.



C O R N E R S



C O P I N G



F R E E S T A N D I N G





TERRACES

Keystone products can also be used to create terraces or tiered walls. When constructing a terrace wall, a simple rule of thumb is that the terrace distance between any two walls should be equal to twice the height of the lower wall for each wall to be considered as an individual structure.

Note: This rule does not apply to walls built on steep slopes or over poor soils of low friction strength, in which case they need to be evaluated for global stability on a specific project basis. Consult a qualified engineer for complex terrace situations.

CREATIVE OPTIONS

As a distinctive detail to any retaining wall, Keystone Retaining Walls allow for creative options in color or texture geometries in the wall. Create a personalized look for your project. Keystone's versatility can fulfill any designer's creativity!



W A T E R



A M P H I T H E A T E R



P L A N T A B L E



The Technical Side

The two most common retaining wall structures built today are simple gravity walls and larger composite reinforced soil wall structures. Keystone offers products and specific design methodology for both structure types conforming to local building codes and national standards.

GRAVITY WALLS

One of the most basic types of retaining walls, the gravity wall, relies on its mass and cross-sectional geometry to resist the earth pressure that is exerting force to move the structure in a lateral direction. Keystone Retaining Wall Systems are able to resist lateral pressure with their unit weight and deep embedment shape. The mortarless, yet structurally interconnected, Keystone units also promote the free flow of water drainage to prevent hydrostatic loads. For low, non-critical applications, Keystone products make highly cost-effective gravity wall structures.



REINFORCED SOIL WALLS

For taller or more critical walls, Keystone units are combined with soil reinforcement options (such as extensible geogrids, geotextiles, inextensible tie-back anchors, or galvanized steel ladder reinforcing) to create larger composite structures. With this properly designed combination, the reinforced soil mass can support greater earth pressure and surcharge loads. These composite structures have permitted the construction of retaining wall structures over 60' (18 m) high. Call your Keystone representative to see which option will work best for your project.



GEOGRID REINFORCEMENT

Since the early 1980's, geogrids have proven successful in providing durable soil reinforcement for the retaining wall industry. Proper design methodology today incorporates the laboratory tested connection strength of concrete units and geogrid in all reinforced retaining wall systems. Geogrids are made from high-density polyethylene or high-tenacity woven polyester yarns.

THE ADVANTAGES OF GEOGRID REINFORCED STRUCTURES INCLUDE:

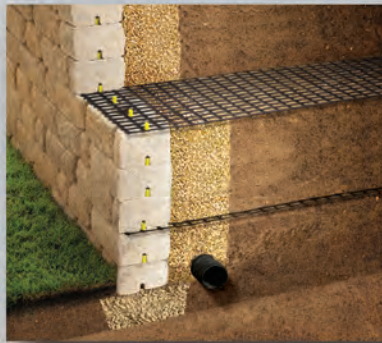
- ▶ Economical construction by utilizing a wider range of site soils for the reinforced fill zone, minimizing the need to import select fill.
- ▶ Construct walls faster without the delays required for shop drawings, forming, steel placement and curing time of site cast concrete; the wall structure and backfill are constructed at the same time.
- ▶ Eliminates the need for deep structural footing and excavation due to flexible versus rigid structure system.
- ▶ Provides durability; long term performance resists effects of water, micro-organisms, alkali or acidic soils.

SYSTEM DIFFERENTIATION

The product design features of the structural units differentiate Keystone from all of the competitors. Keystone structural products are specifically designed and engineered for optimum efficiency with all system components. The interaction of these system components is critical to wall performance and defines Keystone as a true “wall system”.

SYSTEM COMPONENTS

The components that make up a segmental retaining wall include: concrete facing units, geogrid reinforcement, drainage material, and fiberglass pins. The high-strength fiberglass pins are the core of the Keystone system and integrate all of the components. The open cell design of Keystone structural products creates a matrix for unit drainage fill that increases unit-to-unit shear resistance and pull-out capacity of geogrids and also adds stability within the wall. Geogrid reinforcement material, connected to high-strength pins and confined in this cell matrix, provides a strong and secure connection within the Keystone system. Horizontal geogrid placement, from the Keystone wall over properly compacted soils, creates a reinforced soil mass that is connected with the wall system.



SYSTEM PERFORMANCE

When you have a critical retaining wall application, demand the proven performance of a Keystone Retaining Wall System. Keystone’s system components support soil compaction efforts, unit installation, and the drainage fill that is necessary for the construction and performance of soil reinforced walls. For your next retaining wall project, specify the only system that is designed to integrate all of these system components for optimum performance.

The interaction of these system components defines Keystone as a true “wall system”.



Simply Beautiful



Keystone – At Your Service!

Since introducing its first concrete segmental retaining wall products to the marketplace, Keystone has been a leader in providing site solutions in erosion control and soil retention methods. Our focus is to provide customers with solutions to successfully complete their project with our products. We not only offer superior products, but outstanding support services as well.

RESEARCH AND DEVELOPMENT:

Keystone is dedicated to the development of site improvement products. We strive to stay on the cutting edge of industry trends and technology in order to offer the highest quality and state-of-the-art products available on the market.

SALES:

Keystone's sales support extends worldwide. We offer product, installation, and design seminars to architects, contractors, engineers, and homeowners alike. Our sales associates are retaining wall specialists who are available to provide customers with the training and education needed to make working with Keystone products simple, efficient, and rewarding.

MARKETING:

Keystone's marketing department provides full collateral support for our complete product line. These marketing efforts ensure that our customers always have the Keystone product information they need to make their job easier. Keystone marketing materials and tools are created with our customers in mind – a web site, design and installation manuals, brochures, idea guides, and more.

ENGINEERING:

Keystone offers complete engineering and design services including:

- ▶ Preliminary design and estimating
- ▶ Technical assistance during construction
- ▶ Specialty details
- ▶ Test data – shear tests, connection tests, water tests
- ▶ KeyWall® design software support

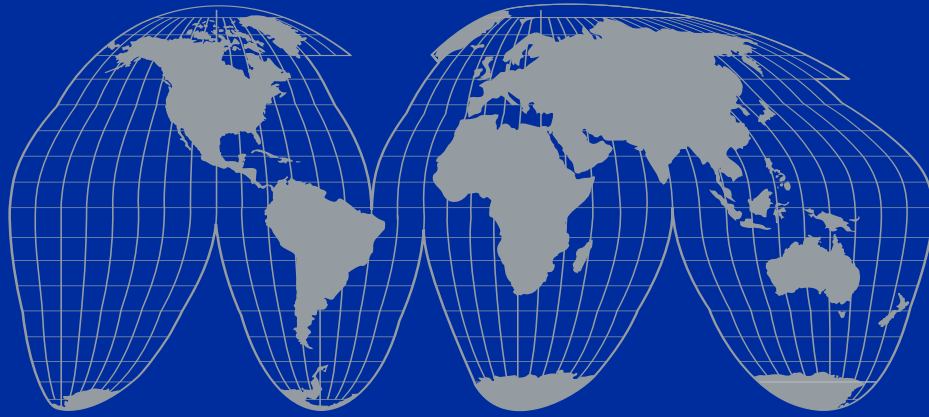
Our in-house engineering staff provides focused technical support in all of the phases of Keystone retaining wall design and construction.

INTERNET:

The Keystone web site, www.keystonewalls.com, is an interactive resource offering all of Keystone's product information and marketing tools. This site is a one-stop source for all the Keystone site solution information you need, with individual portals for designers, contractors, and homeowners. The website also offers information about our unique design software for retaining wall layout and design.



www.keystonewalls.com



We reserve the right to improve our products and make changes in the specifications and design without notice. The information contained herein has been compiled by KEYSTONE and to the best of our knowledge, accurately represents the KEYSTONE product use in the applications which are illustrated. Final determination of the suitability for the use contemplated and its manner of use are the sole responsibility of the user.



Retaining Excellence

