BUILDING BLOCK SYSTEM
ERECTA SWITCH is a building block system of parts and assemblies that lets you construct common and not so common sensing instruments. It’s a product that reduces cost as much as 90% and allows you to create what’s needed in about the time it takes you to read this page.

IT STARTS WITH A SWITCH
Fluid, liquid level and temperature switches are the system’s sensing elements. There is where things usually start. Specially designed ERECTA SWITCH hardware complements the sensors making a variety of constructions and permutations possible. Projects start with the selection of the sensing switch. Then by attaching ERECTA SWITCH components, geometries are altered, functions expanded and previously expensive functions become practical and affordable.

Like any construction set, what is built and its purpose is in the "eye" of its designer. That’s you. creations can be truly imaginative because there are no bounds beyond the physical limitations of the ERECTA components. The factorial combination of size, material, function and geometry is enormous. Anything can be possible. Uses will transcend classical sensing switch applications. ERECTA SWITCH solutions provide many new options for the plumbing or interconnection of liquid, gas and electrical wiring.

IT’S AS EASY AS IT GETS
ERECTA components are precision, screw together, snap together, construction parts and assemblies. Yet attachment interfaces are fitting sealed. Active components, like the liquid level and flow sensors, are factory assembled as your role is basically one of screwing and snapping a few pieces together.

WORKS WITH ANY PIPE THREAD DEVICE
ERECTA threads are standard NPT and NPS pipe threads. Although the components are designed as comparison to compact products, they are usable with any part or product having complementary threads. ERECTA SWITCH adapters, bulkhead fittings, precision nipples, connectors, support brackets, wiring receptacles and relay housings invite applications having nothing to do with conventional switch products. For example, they may be used as plumbing for any compatible fluid or wiring need.

Suppose you need a low cost eight gauge. Use our translucent Polypropylene pipe nipple with a couple of our bulkhead angle connector sets and you have "instant eight gauge". Add our four receptacles to any device having a 1/4" to 1/2" pipe connection at the pigtail egress and have a weather resistant place to take that splice or connection. Need a low cost 55 gallon drum switch that will turn when the drum is empty? That’s easy. Add our extended stem set and 2" adapter to a liquid level switch and you get a drum switch for about $20.00 in 100 piece lots.

EVEN THE COMPETITION WINS
Many installations can be made more cost effective by combining ERECTA SWITCH hardware with sensing switches manufactured by others. If you manufacture control devices which must withstand the effects of a corrosive liquid, enhance your product while reducing cost by incorporating ERECTA SWITCH. Add your expertise to our wide range of accessories and dazzle your customers with quick, inexpensive solutions.

NO BIG DEAL
There’s no need to abuse simple technology by making it a "big deal" to add a switch or change a mounting. With ERECTA SWITCH, changes like this are a matter of buying a box of parts, make it longer. Make it shorter. Add switches. Mount it where you want it. . . . This is what ERECTA SWITCH does.

SMOOTH APPROACH
Before ERECTA SWITCH arrived on the scene, designs which permitted efficient manufacture could not be easily changed to accommodate special needs. So it was that an assembly, which amounted to a custom effort and fabrication, construction. Often expensive and usually not of the same quality as a "tooled" design, the custom fabricated product is at best, problematic.

ERECTA SWITCH has changed all of this. Established, tooled products can now be reliably transformed to achieve new functions. Add a switch here, a switch there, a few pieces of hardware . . . . Quickly, an inexpensive solution, can be put together by just screwing and snapping a few parts.

COMPONENTS, SETS AND CONSTRUCTION SCHEMES
The expansive nature of a building block concept requires that product possibilities be confined so the line is easy to deal with. Our electronic catalogs show the line as switches, components, switch sets and component sets. Sets are shown as dimensioned assemblies accompanied by the list of constituent components. How the components are intended to be put together is portrayed in easily understood graphics.

A collection of suggested plans for the building of frequently encountered instrument constructions are also provided. We call these plans "construction schemes". Schemes are plans for a project rather than a product you can purchase.

NOMENCLATURE INTERPRETATION
For purposes of scene and document display, nomenclature are constrained to 12 characters. Although our naming system is rule driven, growth has produced some stretching of the rules. Nevertheless, the system is consistent and easily understood.

The system first identifies the set’s series or family, then the style considerations, then the material option and finally the size selection when applicable. Each selectable variable attributes such as material and size are always shown as upper boxes. I.E.: 10-782-

Series Model/style Material Option
Here’s another example:

10-710-

Series Model/style Material Option

PRODUCTION ORGANIZATION AND SELECTION
Products are organized as sets, identified by their series number: 8, 16, 20 and so on. Sets are headed by a switch or family of switches which share common attributes. So you must first determine the switch of interest and its series number. Then select from the series component set the particular switch, set, parts, or sets parts required.

Remember . . .

1. SERIES
2. MODEL/STYLE
3. MATERIAL OPTIONS
4. SIZE OPTIONS
MATERIAL SELECTION

ERECT Switch products are optionally available manufactured of Polypropylene, acetal or Kyvar PUD.

When material options are offered, the characters are printed in the product's nomenclature for purposes of material selection and specification. (i.e.: 15-650-6P (PP denotes Polypropylene)

We suggest material selection be based upon compatibility with the application's environment. Pressure, temperature and chemistry are important factors. Generally speaking, Polypropylene and Kyvar PUD are suited for water based solutions. Acetal is suggested for hydrocarbon applications such as gasoline and lubrication oil.

IDENTITY

Our Polypropylene products are colored grey, black and blue. 1% glass fibers are added to improve performance at cold temperature and to facilitate welding processes. Polypropylene is often called “poorman’s Delrin” because of its low cost and high mobility. “Polypro” is the popular choice for most water based applications.

Acetal products are colored red and characterized by red, yellow and black shiny appearance. When strength and resilience are important, Acetal may be the best choice. It is compatible with many solvents and will handle alcaline water based solutions over a wide temperature range.

Kyvar PUD is light tan in color. It is characterized by its high mobility in the presence of corrosive environments. PUD is a high density material which may limit its application in low specific gravity liquids.

Often the materials used for other parts of your system will suggest an acceptable selection. (i.e.: if the tank, pump and valves are manufactured of polypropylene, why not use polypropylene for the liquid level or flow switch as well?

Chemical Resistance

Performance data covering 500 chemicals are presented on our Chemical chart for the PUD. This Chemical Resistance chart, for IBM and IBM compatible computers, provides information about corrosion resistance and the effects of corrosion on mechanical properties of Polypropylene, acetal and Kyvar PUD. See Product Guide page 61 for ordering instructions. If you are reading this page on your computer screen now, press [Esc] to return to the main index. You can then select Chemical chart to review or printout the Chemical Resistance chart.

Keep in mind, temperature and other environmental factors will influence chemistry. For pressure, temperature and specific gravity ratings, select “Application Environment” on the main index.

ANCILLARY COMPONENTS

Springs are Titanium metal or T-316 Stainless Steel depending upon the product selected. O-rings are Teflon Fluorocarbon rubber.

FINEST AVAILABLE

Only the very best materials are used. Premium switches, manufactured by Toshiba Electric and OKI Electric Companies of Japan are at the highest quality. Our plastic raw materials are manufactured and formulated by Eastman Chemical, TOYO, General Electric, Kelco and TOCHIN of North America. Our plastic material options, offer solutions for the widest possible application range, and...we do the molding so no regard, contaminant control and process replication is totally under our control. Simply stated, there are no better materials available for this class of product.

01-19-97 ERECT-3

ANOMALIES

Parts are injection molded in the same mold regardless of material. Molds are designed to produce design dimensions when molding our Polypropylene formulations. As noted above, Acetal and Polypropylene parts are slightly different dimensions. They are smaller than their Polypropylene counterparts. Assemblies made with parts of like materials will fit correctly. Molds that material assemblies will exhibit fit problems, particularly at threads and clamp attachments.

SPECIAL CONSIDERATIONS

Excluding the effects of chemistry and corrosion resistance, successful operation at high temperature has little to do with the melting point of our plastic assemblies. Melting points are above 470ºC and our products are rated at 90ºC. Of greater concern is the relatively high coefficient of expansion of the plastic structures and the impact this has on the stability of the switching devices. Kyvar PUD exhibits the largest dimensional excursions. That plastic structures expand and contract several thousandths of an inch over the 0 to 80 C range suggests application at or near these extremes should be questioned. Consider, for example, the forces likely to occur when a plastic part is joined to a metal part and temperature extremes are encountered. Then in doubt, performance verification tests should be considered.

INSTALLATION TIPS

Isolate pull stresses when stripping leads. Temporarily protect pipe surfaces from tool marks with tape. Expose male threads and O-ring seals with liquid compounds prior to assembly. Resistance O-rings enhance seal reliability when all O-rings are engaged. Diameter seals are engaged by virtue of the assembly dimensions, and seals, however, must be engaged during the act of assembly. Consider a technique to confirm engagement, i.e. confirm and seal engagement by measurement. An effective end seal can be achieved with .010" to .020" seal compression, avoid excessive engagement as this may soult the O-ring causing it to slide out of position.

When screwing switches to other assemblies, allow the free ends of the leads to rotate, if necessary, help the process along so that wires do not become twisted.

When possible, adopt a tentative approach to assembly. That is, first assemble components in their logical sequence, hand tight. Then methodically tighten joints to achieve correct seal engagement.

CAVEATS

ERECT Switch users get more instrument at less cost compared to any other method or product available to the OEM. However, there are inseparable caveats:

• The ERECT Switch concept assumes the users know what he is doing. This is an OEM product intended for OEM manufacturers. It should be purchased by those intending to assume responsibility for the construction outcome.

• Use only in those applications which are known to be electrically, chemically and mechanically compatible. Do your homework. Perform tests.

• Deal with reactive loads in whatever way necessary to subdue arcing at the switch element contacts.

• Make certain O-ring seals are in fact engaged.

• Avoid assembly or installation procedures which result in bending, stressing or shocking the switching element. In other words, don't drop, bend or squeeze switches.

ERECT-4
LEVEL OF DIFFICULTY DEFINITIONS

Essentially, this is a concept in which fully manufactured and tested switches and components are shipped ready for use. They connect to one another so assembly is usually a matter of snapping or screwing elements together. Erecta SWITCH components do not require glue, solder, or part machining. And, our detailed catalog drawings are often adequate for documentation purposes.

The level of difficulty to construct a set or scheme is assigned as level 1, 2, 3, or 4. Set and scheme pages show this assignment below the date in the Erecta SWITCH block at the lower right hand corner of the page.

LEVEL 1 - 300 seconds.
Multi switch station construction. Requires snapping and/or screwing several parts together. Several O-rings may be part of the assembly. Tapered pipe threads require application of Teflon tape sealant. Components go together loosely. Visual inspection tool, thread lubricant and continuity checker, disciplined assembly. Assembler must interpret Set and Scheme catalog drawings. Dry operational test performed prior to use.

LEVEL 2 - 120 seconds.
Single switch station construction. Requires snapping and/or screwing several parts together. One or more O-rings may be part of the assembly. Tapered pipe threads require application of Teflon tape sealant. Requires open end wrenches, thread lubricant and continuity checker, disciplined assembly. Assembler must interpret Set and Scheme catalog drawings. Dry operational test performed prior to use.

LEVEL 3 - 240 seconds.
Multi switch station construction. Requires screwing and/or snapping several parts together. Several O-rings may be part of the assembly. Tapered pipe threads require application of Teflon tape sealant. Components go together in sequence. Tapered pipe threads require application of Teflon tape sealant. Requires open end wrenches, crimping tool, thread lubricant and continuity checker. Disciplined assembly. Assembler must interpret Set and Scheme catalog drawings. Dry operational test performed prior to use.

LEVEL 4 - 360 seconds.
Multi switch constructions with interface devices and/or cable assemblies. Requires screwing and/or snapping several parts together. Several O-rings may be part of the construction. Components go together in sequence. Tapered pipe threads require application of Teflon tape sealant. Requires open end wrenches, crimping tool, thread lubricant, screw driver and continuity checker. Disciplined assembly. Assembler must interpret Set and Scheme catalog drawings. Dry operational test performed prior to use.

* Experienced assemblers easily achieve noted construction times.

CLASSICAL PROBLEMS

INCOMPATIBLE LIQUIDS
Understanding that a chemical may have deleterious effects on our product’s plastic structure is essential. Assuming compatibility with the chemistry, consideration must then be given to the nature of the liquid. How does it flow? What’s floating around in it? Etc. Is it a saturated solution that may precipitate salts on the floor? Is it a high viscosity liquid? Is it sticky? Are there iron particles which may be attracted by the magnets? . . . With this in mind, using our product in any liquid other than clear water should be preceded by tests.

LAVE MOTION - TURBULENCE
Single point level switches have small differentials between their on and off states. If installed at the surface of a reservoir of moving liquid, they will respond to the waves and ripples. This means the switch may be switching on and off many times per minute. A situation that may drive the load device “crazy” and contribute to early system failure. To inhibit the effect of wave motion and turbulence use a hose shield. If this is not practical, inhibit the switch with a time delay relay or use two switches and a hatching relay to expand the differential.

RADIANT HEAT
A common application for small level switches is the control of make-up water. As long as the switch is in water, we can assume the ambient temperature is within its capabilities. However, care must be taken to locate the switch so that it is not exposed to heat radiating from or reflected by heating elements. Excessive temperature could warp or otherwise deform the plastic parts.

INCOMPLETE ASSEMBLY
Erecta SWITCH assemblies can be configured in endless ways to accommodate just about any need. However, if reliability is an objective, they can only be assembled one way . . . and that’s the correct way. O-rings must be present, threads must be correctly engaged and tightened, all with an appreciation for the component’s function and the mechanical peculiarities of plastic parts and assemblies.

FAIL SAFE INSTALLATION
Prudent engineers, like good pilots, always allow themselves a way out. It’s good sense to install automatic control devices so that they will fail safe. E.g. power supply failure should not cause liquid to overflow. Failure of a relay or motor starter should not cause liquid to overflow. And failure of a level, flow or temperature switch should not cause an unsafe condition. Predictable off normal conditions should be satisfied by prudent fail safe design. If this can not be achieved by circuit or component configuration, then a backup scheme must be put into place. Going automatic does not abrogate responsibility for the predictable.
CLASSICAL PROBLEMS

SWITCHING CAPACITY
This is, perhaps, the most misunderstood capability of reed switch equipped devices such as our liquid level and flow sensing switches. Switching an incompatible load is an invitation to failure. Please read the pages of this catalog entitled "Electrical Interfacing".

IMPACT SHOCK
Be cradle the glass reed switch in a stress relieved support system and then lock it into place with a specially formulated, comparable potting compound. "Beedex" survive reasonable mishandling. This does not include dropping the product. The product may break like it's resilient . . . but it is not. Any fall may damage the unit. A dropped unit may look OK or even test OK but still be damaged inside. The bottom line is . . . don't drop switches. And if it should happen, then discard the suspect switch.

PLASTIC CONSTRUCTION
The dictionary definition for "plastic" includes the following: "easily influenced or manipulated; impressionable; pliable, suggests something easily bent, twisted or manipulated." Our products are manufactured of plastic and therefore should be characterized accordingly. Our choice of Polypropylene, Acetal and nylon is based upon the aggregate of these combined attributes:

- Resistance to chemical attack.
- Mechanical rigidity and strength.
- Mechanical stability over a wide temperature range.
- Dielectric strength.

All of our materials can be bent, squeezed or stressed. Stressed materials still exhibit some degree of "cold flow". With this in mind, reasonable care must be used during installation.

Use appropriate tools. Apply torque only to the hex. Avoid manipulations that may transmit force into the product. Isolate pull forces on leadwires when stripping wire ends.

CONDENSATION
In situations in which condensation is possible for condensation to form, users must take measures to prevent water from entering switches at the leadwire apex. Although wires are surrounded by potting compound, the bond between potting compound and plastic parts is basically one of cohesion since our plastic materials are essentially non stick surfaces. If water is present at the apex, sooner or later it may penetrate the switch cavity, resulting in switch malfunction. If there is a possibility for condensation to form, do something about it. Vent a low spot in the conduit or a drain exists and apply a generous amount of sealing compound at the apex as an additional measure of seal integrity.

CONSTRUCTION SERVICES

DIRECT SWITCH ASSEMBLY/CONSTRUCTION SERVICES
If putting parts together or making working instruments is not for you . . . that's OK. Our VMAs will do it for you. A full range of affordable assembly and construction services are provided by our authorized VMAs (Value Added Distributors). VMAs are both stocking distributors and factory trained assembly service providers.

DURABLE CONTROLS

TEL 1-800-366-6052
FAX 1-800-366-6052
1605 TECHNOLOGY DR, BLDG. 300
PLANO, TX 75074

TEL 1-972-422-1213
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HARTFORD, WI 53029-0006