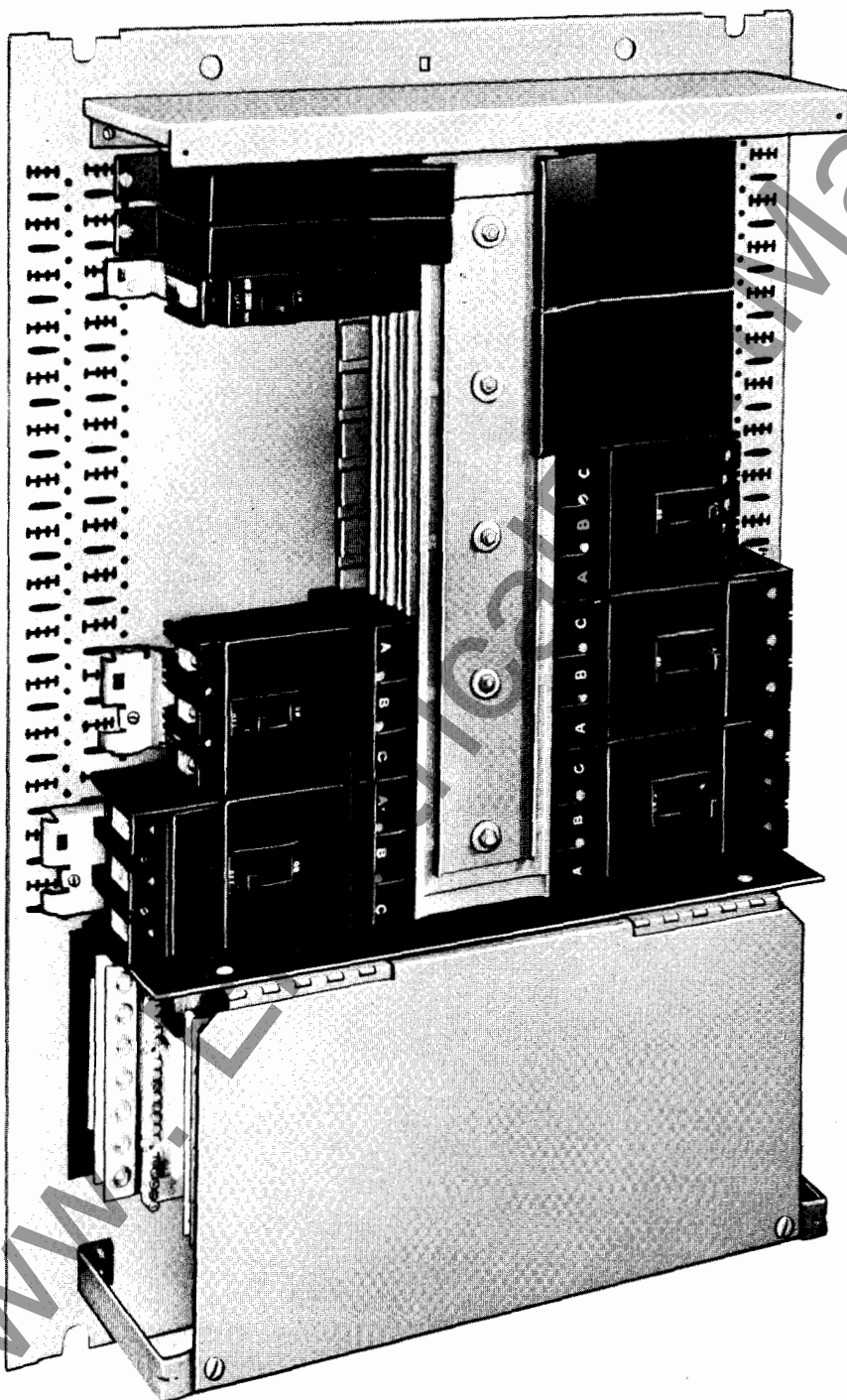
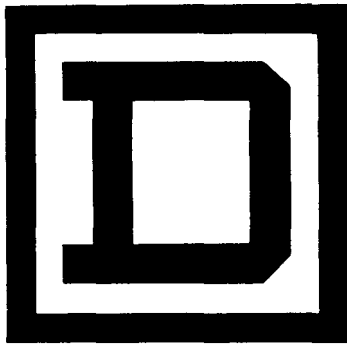


INTRODUCING...  
**I-LINE®**  
POWER  
PANELBOARDS



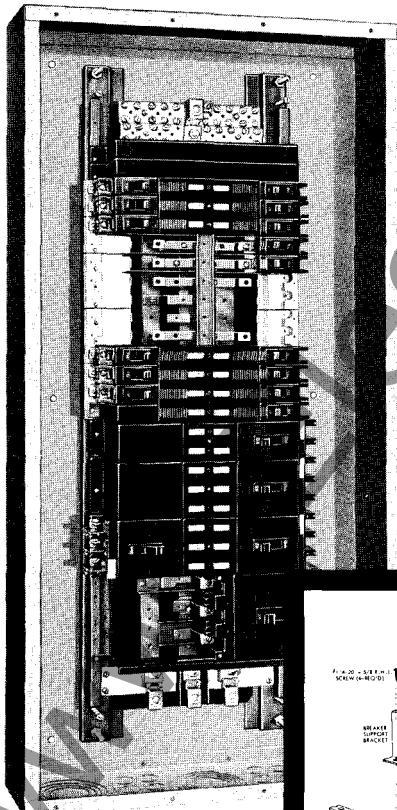
for circuit  
breakers  
through  
600 volts



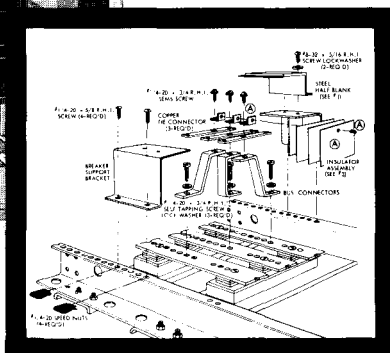
# COMPLETELY NEW **I-LINE** SIMPLEST, MOST VERSATILE

## **I-LINE** design solves these old power panelboard problems:

Circuit changes used to be costly and time-consuming. Only breakers of the same frame size could be mounted opposite each other. So breakers often had to be grouped together in a particular area of the panelboard. Space was wasted. The necessary complexity of breaker arrangements made changes expensive because of down-time. And when a change of circuit breakers was planned, expensive mounting hardware kits, separate from the breakers, had to be ordered. These kits consisted of many parts which had to be assembled on the job. It was hard to accomplish circuit changes quickly.



Old-Style panelboards, such as the one at left, were complex. This complexity meant extensive down-time for circuit changes, as shown below.



## **I-LINE**<sup>®</sup> SAFETY

... is greater, and more thoroughly assured than with any other panelboard available. Why? Because, unlike all other panelboard manufacturers, Square D offers an **integrated equipment rating** ... concrete proof of **testing breakers and panelboard together in operation** for up to 75,000 amperes RMS asymmetrical available on a short circuit fault.

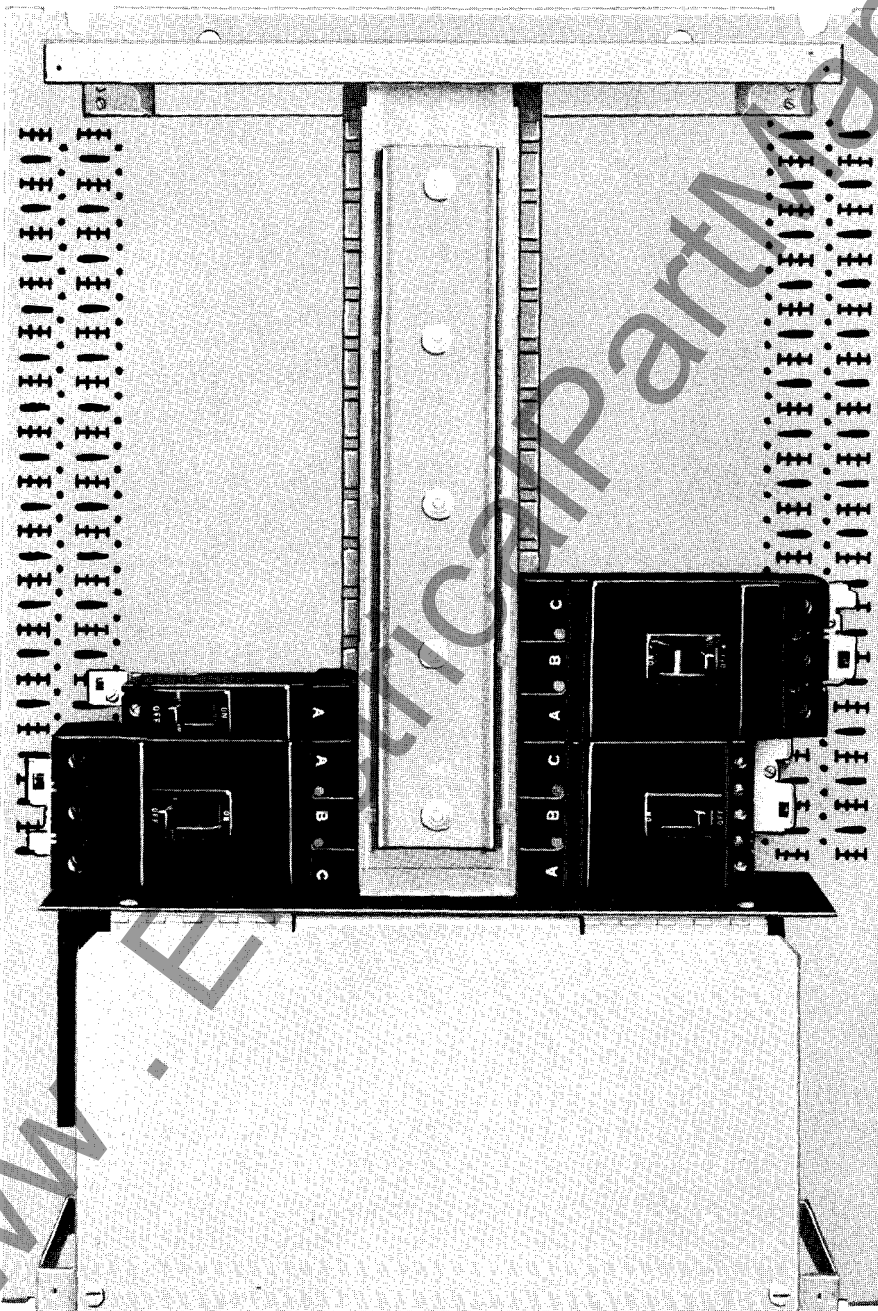
## **I-LINE**<sup>®</sup> SIMPLICITY

... makes power panelboards easier to select, easier to install, easier to work with for circuit changes. Locally-available breakers come as single units with mounting brackets, hardware and all connectors already attached. Out of the box, three quick steps, and they are in service.

## **I-LINE**<sup>®</sup> VERSATILITY

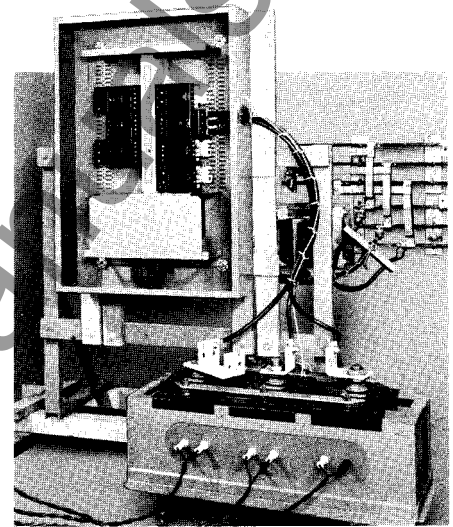
... comes from the heart of the I-LINE design, the single vertical stack of busbars. It is possible to mount breakers anywhere, greatly increasing the flexibility of arrangements. Conventional panelboard design has meant only breakers of the same frame size could be mounted opposite. With I-LINE design breakers can be mounted **anywhere** without regard to frame size.

**DESIGN GIVES YOU THE SAFEST,  
POWER PANELBOARD EVER BUILT:**

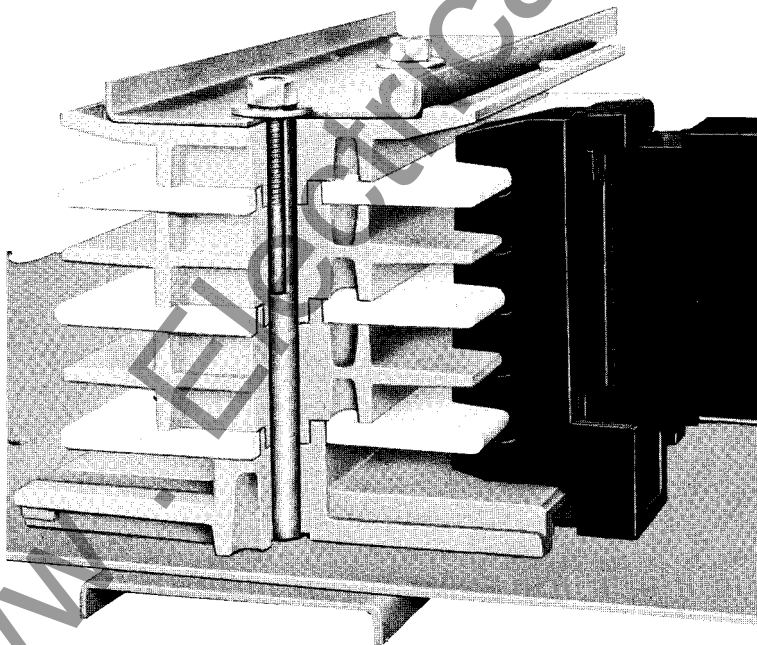


# HOW INTEGRATED EQUIPMENT RATING MAKES **I-LINE**® POWER PANELBOARDS BEST FOR SAFETY:

The **integrated equipment rating** is the short circuit rating of the complete I-LINE Power Panelboard with branch circuit breakers installed, definitely established by testing at the Square D High Power Laboratory in Cedar Rapids, Iowa. The actual test set-up is shown at right. The integrated equipment rating completely verifies the safety of the physical bracing of the bus system. It proves the breaker interrupting rating with the breakers installed on the bus assembly. It affirms the ability of the line side bus and the insulation assembly to withstand any ionized gases discharged from a branch circuit breaker during a short circuit interruption without causing a line side phase-to-phase arc on the busbar assembly. It establishes that any arrangement of branch circuit breakers can be made safely, without regard to frame sizes. And it means the complete I-LINE Power Panelboard, with branch circuit breakers installed, has successfully passed heat rise tests in accordance with UL procedures using breaker arrangements and loadings to develop the most severe heating conditions possible with a fully-loaded panelboard.



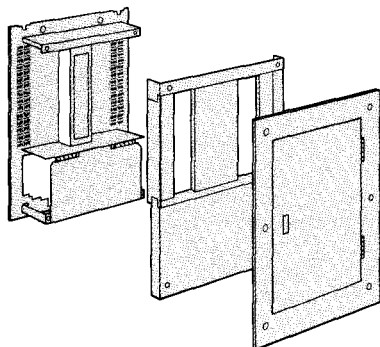
## THE SINGLE VERTICAL STACK OF BUSBARS MAKES THE INTEGRATED EQUIPMENT RATING POSSIBLE:



**I-LINE** plated busbars are assembled on the panelboard's interior pan in a single vertical stack. Molded polyester glass insulators separate and continuously support each busbar. Larger polyester glass insulators are placed at the bottom of each stack. The busbar stack is securely held to the interior pan by hardened steel bolts jacketed in high dielectric strength, impact-resistant polycarbonate sleeves.

This completely new I-LINE design concept makes panelboard bussing much more compact, yet increases assurance of safe, rated operation.

# ADDITIONAL FEATURES PROVIDE UNPARALLELED PERSONNEL SAFETY:

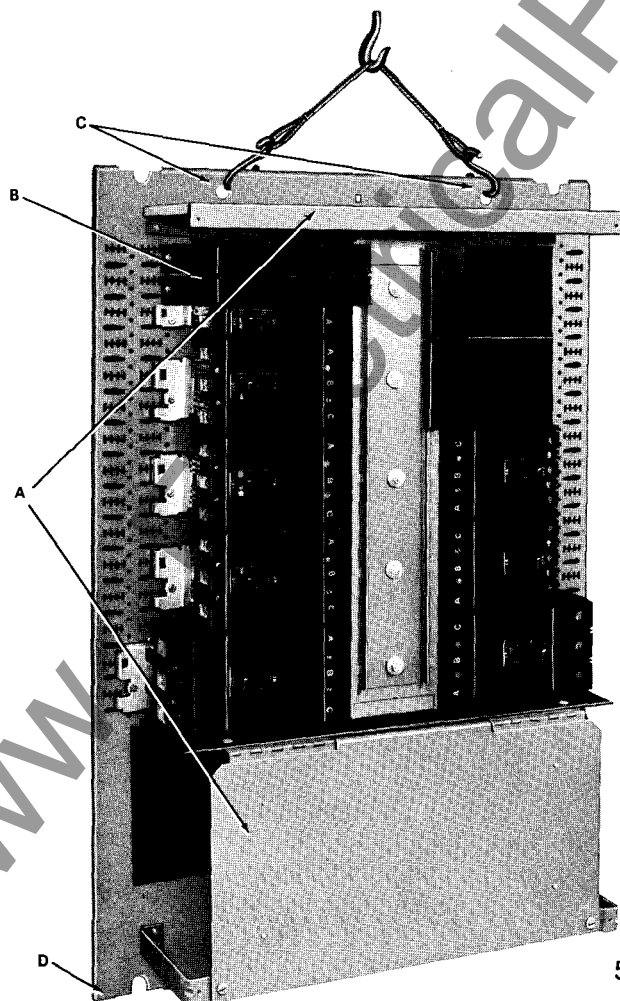
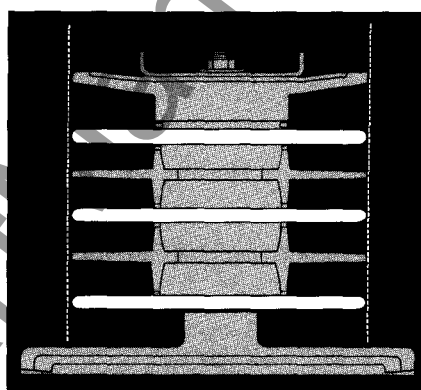


## **"Dead front" protection is complete:**

Even with the exterior trim and interior trim removed, the I-LINE Power Panelboard is "dead-front", as indicated with gray on the illustration at left. A captive hinged lug cover protects personnel from accidental contact with the main lugs. On bottom feed, as shown here, the hinged cover can be held open by a retaining strap while personnel work on the lugs or verify phase loading.

## **Busbar insulators are designed to protect:**

The polyester glass insulators at the top of and within the I-LINE busbar stack are made as wide as the busbars themselves. This minimizes the possibility of accidental contact with busbars or line side connectors during routine checking of load side connections when filler plates or breakers have been removed.



## **Barriers guard against hand tool contact with live parts:**

At both the main lug and opposite ends of the busbar stack, I-LINE design provides large dead-metal and insulation barriers to keep tools from coming in contact with live parts, as shown at right (A). Additional protection for personnel is given by dead-metal filler blanks (B) which are designed to safely fill all unused breaker space. The ends of the filler blanks are insulated in case of accidental contact with the bus assembly. Wherever possible, I-LINE design safeguards personnel.

## **Interior installation features are safety-designed, too:**

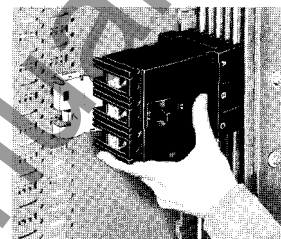
Panelboard interiors can be heavy! I-LINE design provides properly-spaced holes at the top of the interior pan (C) for safe lifting with apparatus. The bottom edge of the interior pan (D) is carefully constructed to give installation personnel a secure means of supporting the interior on a mounting bracket in the bottom of the enclosure while finishing its installation.

# I-LINE® DESIGN BREAKER MOUNTING GIVES YOU SIMPLICITY WITH MAXIMUM CAPABILITY:

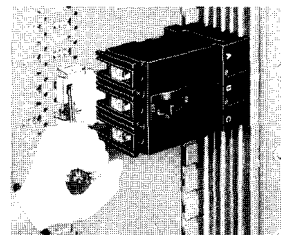
Square D branch circuit breakers are specifically designed for use in I-LINE Power Panelboards. Whether for initial arrangements or in-use circuit changes, breakers are easy to position positively and install. The line of key slots, ratchet slots, and locking bolt holes built into every I-LINE interior pan is designed to receive the breaker brackets.

Breaker mounting is easier and faster than ever in just three steps:

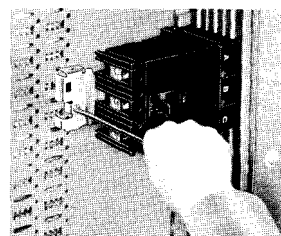
1. First, the line end of the breaker is positioned on the busbar stack, as shown at right. A notch in the base polyester glass insulator of the busbar stack fits a ridge at the rear of the breaker's jaw shroud for sure "straight-on" seating. The breaker mounting bracket fits neatly into the key slots on the pan. The breaker is now properly aligned.
2. Next, a screwdriver is inserted in the ratchet slot to lever the breaker firmly onto the busbars.
3. Then, the captive retaining screw is run down with a screwdriver, locking the breaker in position.



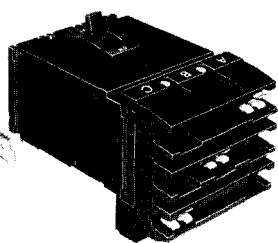
1.



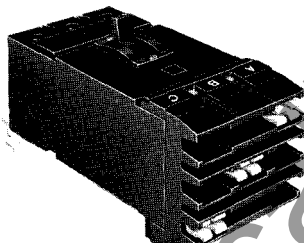
2.



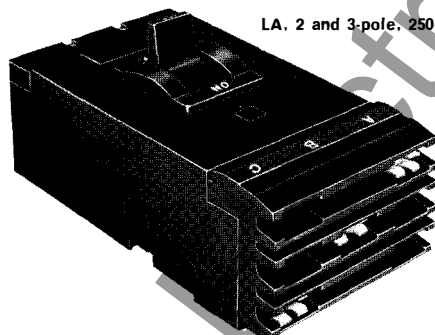
3.



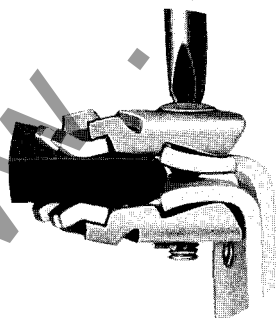
FA, 1, 2 and 3-pole, 15-100 amp.



KA, 2 and 3-pole, 125-225 amp.



LA, 2 and 3-pole, 250-400 amp.



Bolt-on Connection

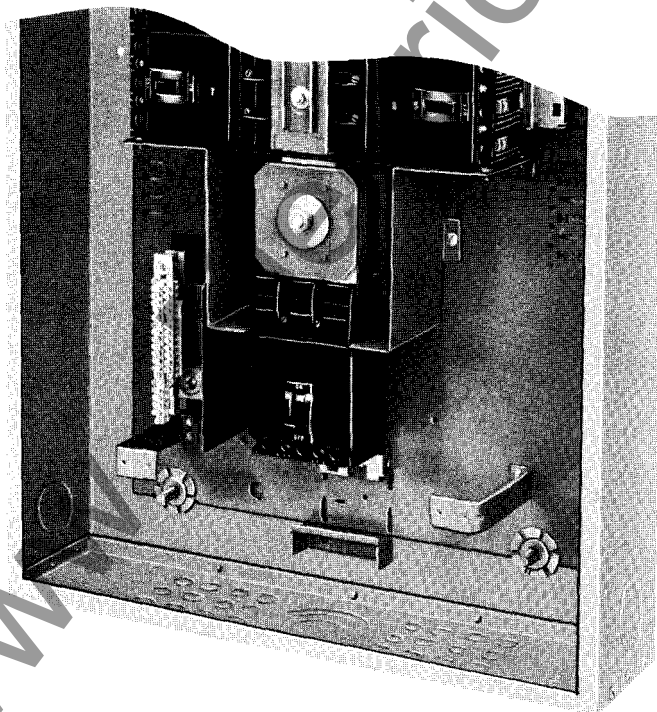
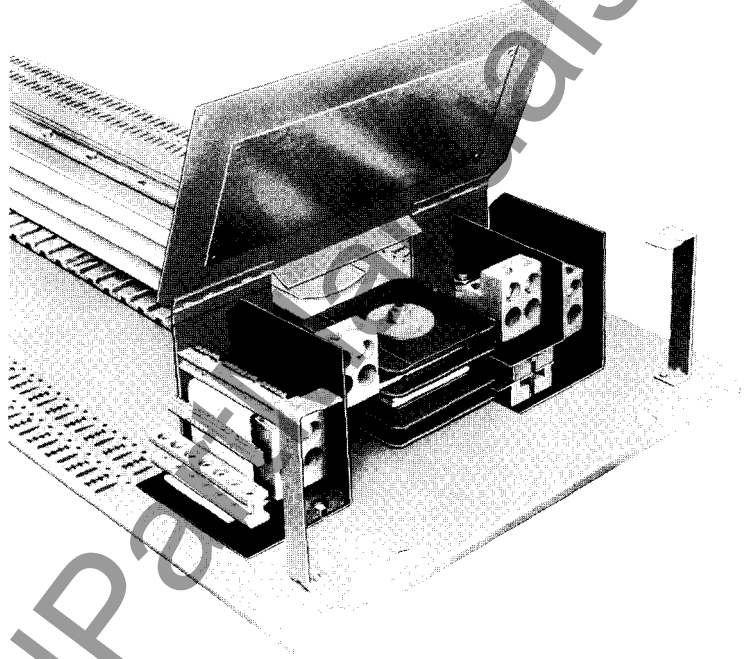
## Square D gives you local availability of a complete range of frame sizes:

Breakers specifically designed for I-LINE Power Panelboards are locally available when they are needed. These plug-on breakers — from a 15 ampere, one pole Type FA, 100 ampere frame to a larger three pole Type LA, 400 ampere frame — have mounting brackets and connectors already attached. I-75,000 branch circuit breakers with maximum 75,000 amperes RMS asymmetrical interrupting capacity are also available on the same frame sizes. Line side connectors of plug-on breakers are "blow-on" type which clamp securely around busbars. In case of a short circuit, magnetic flux makes connectors grasp busbars even more tightly for added protection. Large individual circuit numbers on tough vinyl are permanently bonded to each breaker in a uniform position. Also, the phase of each breaker pole is visibly and clearly identified at the top of each breaker's casing by the white capital letters "A" or "B" or "C". Phase identification at the main lugs is clearly shown in the same manner.

Bolt-on connection is available when preferred. Also available are auxiliary devices for breakers such as VSI-blade, bell alarm, shunt trip, under-voltage trip, and auxiliary contacts.

# MAIN LUGS AND MAIN BREAKER DESIGN GIVES **I-LINE**<sup>®</sup> VERSATILITY:

**I-LINE** main lugs are UL listed for use with either aluminum or copper wire. When a solid neutral is required, it is mounted adjacent to the main lugs. Both are in the same compartment, as at right, barriered for safety on three sides. All incoming cables can be one length, saving time, material and space. The space-saving leaves side gutters completely open for branch circuit breaker wiring, making possible greater versatility in breaker arrangement.



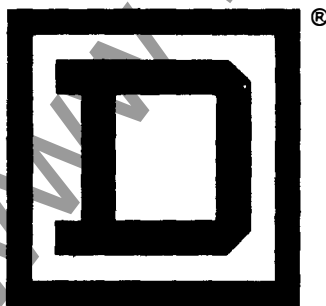
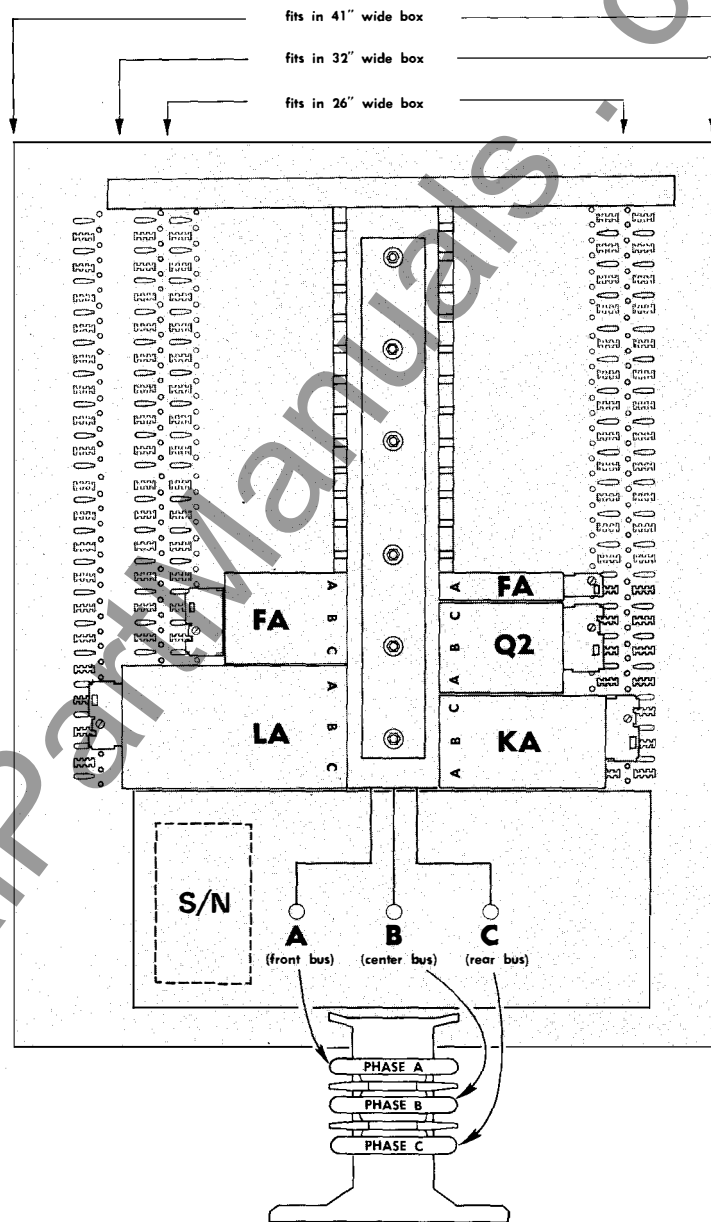
**I-LINE** main breakers on factory-assembled panelboards are vertically mounted. On unassembled panelboards, main breakers are mounted horizontally. In either case, wiring gutters **exceed** code requirements, retaining the branch circuit wiring capability for I-LINE design versatility. Both vertical and horizontal mounting of main breakers was employed during I-LINE panelboard tests. Testing involved connecting incoming line wires to either end of breakers. In any position and with wiring in either end, the main breakers successfully passed all required tests. As an additional safety feature, whether the main breaker is mounted at the top or bottom of the I-LINE Power Panelboard, the handle is always **down** in the OFF position. The main breaker compartment, too, is barrier-enclosed on three sides for additional safety.

# New design makes SELECTION of **I-LINE**<sup>®</sup> power panelboards and components far easier:

The simplicity and versatility of the completely new I-LINE design mean more panelboard capability with fewer separate components. It amounts to this . . . a panelboard setup to do a specific job is decided upon, then specified or ordered. Assembled or unassembled, an I-LINE Power Panelboard arrives on the job site **with all components** needed to put it in service. Breakers are **locally available**, too, when future circuit changes are necessary for different trip settings.

The illustration at right tells the I-LINE selection story. I-LINE design makes it possible for three box widths to provide a full range of power panelboard applications. The 41 inch box takes LA, KA, Q2 and FA breakers. The 32 inch box takes KA, Q2 and FA breakers. And the 26 inch box takes Q2 and FA breakers.

Whatever your need for power panelboards, I-LINE is best . . . for safety, for simplicity, for versatility. Your Square D Field Engineer has further details on I-LINE Power Panelboards. Or contact your nearest Square D distributor.



## SQUARE D COMPANY