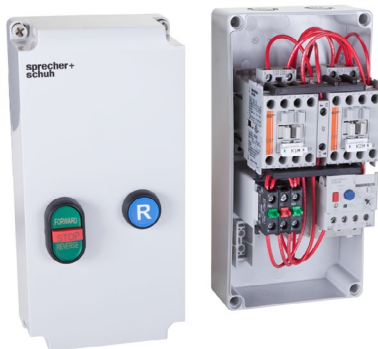


<i>General Description</i>	C0:2
<i>Catalog Number Coding</i>	C0:4
<i>Enclosure Ratings</i>	C0:6
<i>Custom Control Panels</i>	C0:8
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<i>Wiring Diagrams</i>	C1:13
<i>Dimensions</i>	C1:15
Enclosed Contactors	C2:1
<i>Reversing Contactors</i>	C2:4
<i>Single-Phase Contactors</i>	C2:6
<i>Lighting Contactors</i>	C2:8
Non-Combination Motor Starters	C3:1
<i>Reversing</i>	C3:4
<i>Single-Phase</i>	C3:6
Combination Starters	C4:1
<i>Thermal Magnetic Circuit Breakers (MCCB)</i>	C4:2
<i>Fusible Disconnect</i>	C4:7
<i>Non-Fusible Disconnect</i>	C4:9
Explosion-Proof Starters	C5:1
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Pump Controllers	C6:1
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<i>Duplex Controllers</i>	C6:5
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<i>Wiring Diagrams</i>	C7:15
<i>Dimensions</i>	C7:17
<i>Enclosed Contactors</i>	C7:19
<i>Non-Combination Starters</i>	C7:21
<i>Combination Starters</i>	C7:27
Accessories & Modifications	C8:1
<i>Coil & Overload Relay Codes</i>	C8:3
<i>Modifications - Factory Assembled</i>	C8:6
<i>Control Power Sizing</i>	C8:11
<i>Wiring Diagrams</i>	C8:12
<i>Enclosure Dimensions</i>	C8:23



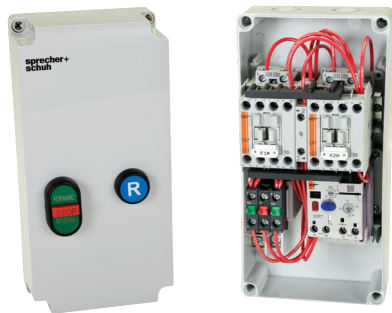
Motor Starters and Enclosed Product

Open & Enclosed pre-wired motor starters and enclosed contactors for any application

C0 Starters & Enclosed Products



KWIKstarters



Enclosed Contactor

In addition to selling “open” components, Sprecher + Schuh also offers a full array of preassembled and enclosed products ready to install when they reach your dock.

Standard or customized

The cataloged products in this section comprise Sprecher + Schuh’s standard offerings. In most cases, engineering drawings and bills-of-material have already been created and assembly procedures have been standardized. Generally speaking, lead times are shorter on these standard items.

- Fractional Manual Starters
- Enclosed contactors
- Magnetic motor starters
- KWIKstarters
- Combination starters
- Explosion-proof starters
- Multi-speed starters
- Reduced voltage starters
- Pump controllers
- Softstarters (see Section D)
- Type E/F combination controllers (see Section F)

Your sales representative and our Engineering department will also work with you to customize any of our standard pre-assembled or enclosed products to suit your exact specifications. Any combination of enclosure types, pilot devices, control power transformers, meters and other modifications can be combined to provide exactly the panel



you need.

UL/CSA approved shop

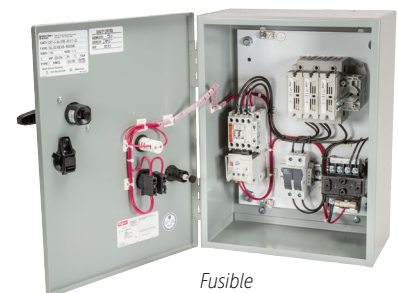
Sprecher + Schuh’s assembly operations are UL Approved UL508A and CSA certified. This means, upon customer request, we can build UL 508A Listed and CSA compliant panels that satisfy the most rigorous UL inspection. Regardless of whether your panel has a UL508A Listing, panels built by Sprecher + Schuh adhere to UL mandated design and wiring standards.

Built with quality and pride

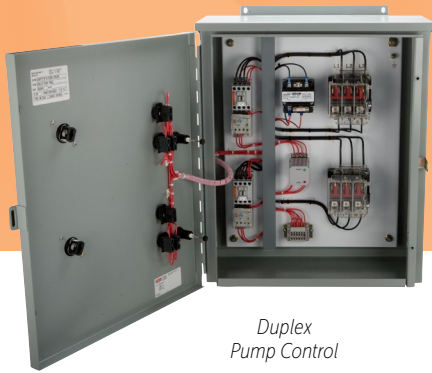
Every panel built by Sprecher + Schuh is meticulously designed and constructed.



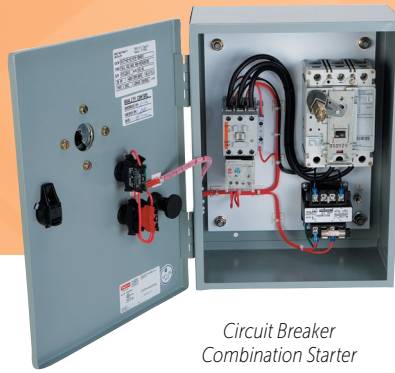
Enclosed Non-combination Starter



Fusible Combination Starter



Duplex
Pump Control



Circuit Breaker
Combination Starter



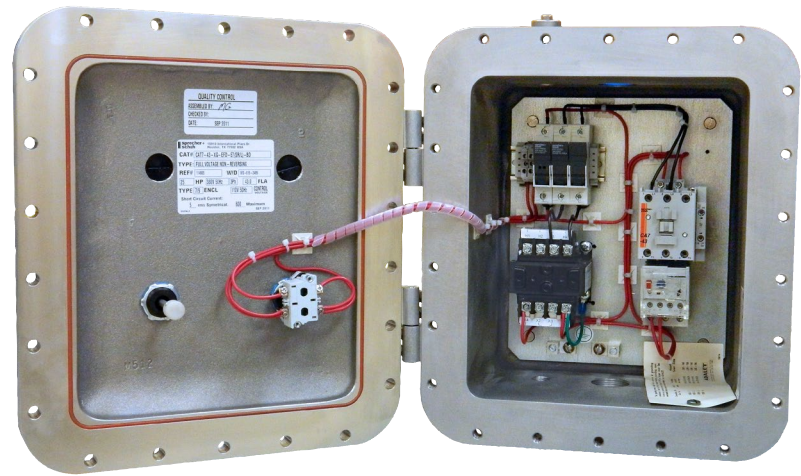
Pump Control
Panel

Where possible, all panels are laid out with generous wiring space. Control wiring is neatly bundled and tied to the back pan. Outsourced components are industrial control quality from name brand manufacturers. Control wiring and device function is electrically tested before the panel leaves our facility.

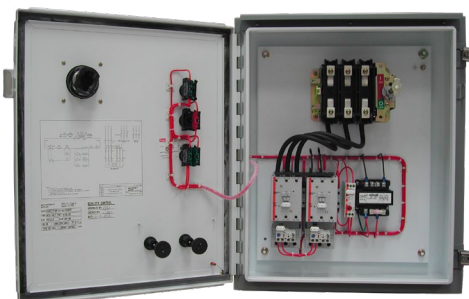
ISO 9001 and ATEX Certified

Sprecher + Schuh is committed to a quality system, focused on customer solutions. This is achieved through superior products and services, excellent customer service, technical expertise, supplier partnerships, and industry leadership.

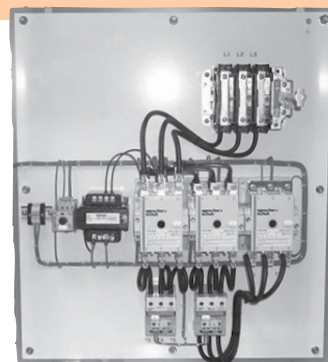
Our facility is ISO 9001 certified. That was the catalyst in allowing Sprecher + Schuh to obtain Atmospheres Explosives certification (ATEX). ATEX certification permits us to build explosion-proof equipment and panels to be supplied across the European Union, including Canada.



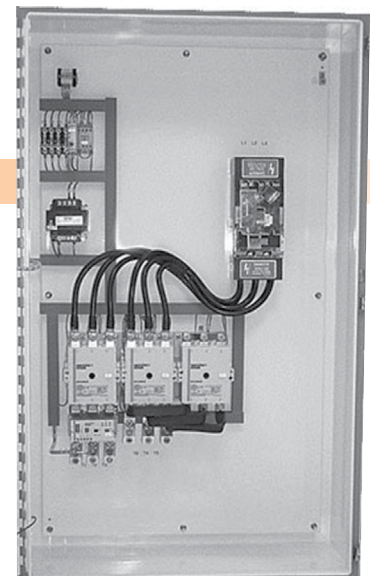
Explosion Proof
Non-combination Starter



Part-Winding Starter



Multi-Speed Starter



Wye-Delta Starter

Catalog Number Coding

Standard Starters and Enclosed Contactors

FMS and KWIKstarters do not use these principles

CAT 7-30 - 480

Contactors or Starter Type

Contactor Size

Coil Code (or CPT)

Non-reversing

CA	Contactors
CAT	Starter
CBT	Starter (Single Phase)
CATN	Starter (NEMA- Three Phase)
CBTN	Starter (NEMA- Single Phase)

Reversing

CAU	Reversing Contactor
CBU	Reversing Contactor (Single Phase)
CAUT	Reversing Starter
CBUT	Reversing Starter (Single Phase)
CAUTN	Reversing Starter (NEMA)

Multi-speed

CAZTT	Multispeed-Two Wind. (Confs/VAR TQ)
CAZHT	Multispeed-Two Wind. (Const. HP)
CAETT	Multispeed-One Wind. (Confs/VAR TQ)
CAEHT	Multispeed-One Wind. (Const. HP)

Reduced Voltage

CAAT	Autotransformer Starter
CAYT	Wye-Delta Starter
CAPWT	Part Winding Starter

Pump Panels

CAPT	Simplex Pump Panel
CAPTN	Simplex Pump Panel (NEMA Size)
CADPT	Duplex Pump Panel

Small - Series CA7 ①

7-9(E)
7-12(E)
7-16(E)
7-23(E)
7-30(E)
7-37(E)
7-43(E)
7-55(E)
7-60(D)
7-72(D)
7-85(D)
7-97(D)

Medium - Series CA9

9-116(-EI)
9-146(-EI)
9-190(-EI)
9-205(-EI)
9-265(-EI)
9-305(-EI)
9-370(-EI)
9-400(-EI)
9-460(-EI)
9-580(-EI)
9-750(-EI)
9-860(-EI)
9-1060(-EI)

AC

24Z
120
220W
277
415
480
600

DC

12E
24E, 24DD
24W
36E
48E
110E, 110DD
220E

AC/DC

24W
48W
120W
480W

Control Transformer

Code	Primary	Secondary
XA	208	120
XB	240	120
XC	480	120
XD	575	120
XE	240	24
XF	480	24
XG	380	110

For additional Control Transformer Codes, refer to Modification pages in this section.

This illustration is for reference only.
Turn to the appropriate page to determine specific catalog number.

① (D) & (E) suffix designates contactors with DC coils

EED

TB20

G

3

Overload Relay

Short-Circuit / Disconnect

Enclosure

Enclosure Cover Control

Options

CEP7-1 - Third Generation Solid State
CA7-9 thru CA7-97
1E... CEP7 O/L Relay, 1 or 3Ø, Class 10, man. reset
F... CEP7 O/L Relay, 3Ø, (selectable)
CEP9 - Advanced Solid State
CA9-116(-E) thru CA9-1060-EI
9... CEP9 O/L Relay 3Ø, (selectable)
CT.. Current Transformers

CT7N - Bimetallic Thermal
CA7-9 thru CA7-97
...A-C CT7N O/L Relay, Class 10, manual or automatic reset
...P CT7N O/L Relay, Class 10, manual or automatic reset, separate mount

G General Purpose - Type 1
D Dusttight - Type 12
W Watertight - Type 4
C Watertight Corrosion Resistant - Type 4X
R Raintight - Type 3R
E Explosion proof - Type 7

Non-Reversing
1 Pilot Light Only
2 Pilot Lights (2) Only
3 "Start-Stop" PB
4 "On-Off" PB
5 "Hand-Auto" S/S
6 "Off-On" S/S
7 "Hand-Off-Auto" S/S
9 "Emergency Stop" PB
0 None
Reversing
2 Pilot Lights (2) Only
3 "For-Stop-Rev" PB
4 "Up-Stop-Down" PB
5 "Open-Stop-Close" PB
6 "For-Off-Rev" S/S
7 "Up-Off-Close" S/S
8 "Open-Off-Close" S/S
0 None
Multi-speed
2 Pilot Lights (2) Only
3 "High-Stop-Low"
4 "Fast-Stop-Slow"
5 "High-Off-Low"
6 "Fast-Off-Slow" S/S

For additional Cover Control Codes, or combinations of cover controls, refer to Modification pages in this section.

Through-the-Door Operated Combo		
Thermal Magnetic Circuit Breaker	Fusible Disconnect	Non Fusible Disconnect
TB(H)15 15 Amp	JF61 600V/30A	JU61 600V/30A
TB20 20 Amp	JF62 600V/60A	JU62 600V/60A
TB25 25 Amp	JF63 600V/100A	JU63 600V/100A
↓ thru ↓	JF64 600V/200A	JU64 600V/200A
TB1200 1200 Amp	JF65 600V/400A	JU65 600V/400A
	JF66 600V/600A	
	JF67 600V/800A	
Blank None	Blank None	Blank None

* TBH represents high interrupt capacity breaker

For complete listing of Option Codes, refer to Modification pages in this section.

NEMA / UL Enclosure Type Definitions

For a degree of protection against:	NEMA / UL Type (IP Equivalent ①)								
	Indoor Use			Outdoor Use		Indoor or Outdoor Use			
	1 (IP23)	12 (IP55/65)	13 (IP65)	3R	3 (IP64)	4 (IP66)	4X (IP66)	6P	6 (IP67)
Incidental contact with enclosed equipment	✓	✓	✓	✓	✓	✓	✓	✓	✓
Falling dirt	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rust	✓	✓	✓	✓	✓	✓	✓	✓	✓
Circulating dust, lint, fibers and flyings		✓	✓		✓	✓	✓	✓	✓
Windblown dust					✓	✓	✓	✓	✓
Falling liquids and light splashing		✓	✓		✓	✓	✓	✓	✓
Rain (limited water allowed inside)				✓	✓	✓	✓	✓	✓
Rain (no water allowed inside)					✓	✓	✓	✓	✓
Snow and sleet				✓	✓	✓	✓	✓	✓
Hosedown and splashing water						✓	✓	✓	✓
Occasional prolonged submersion								✓	✓
Oil or coolant spraying or splashing			✓						
Corrosive agents							✓	✓	
Occasional temporary submersion								✓	✓


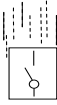

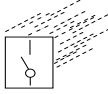
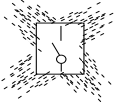
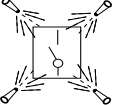
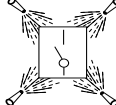
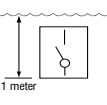
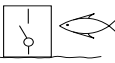

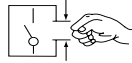
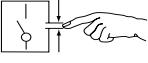
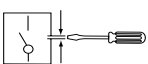
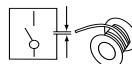


Explosion-Proof Enclosure Type Definitions

NEMA Classifications - Marked with Rated Class, Division, and Group			
NEMA 7	For use in indoor locations classified as Class I, Groups A, B, C or D, as defined in the National Electrical Code		
NEMA 8	For use in indoor or outdoor locations classified as Class I, Groups A, B, C or D, as defined in the National Electrical Code - oil immersed		
NEMA 9	For use in indoor locations classified as Class II, Groups E, F or G, as defined in the National Electrical Code		
Summary of NEC Classes and Group Examples			
Group	Class I (Potentially explosive gas or vapor)	Group	Class II (Potentially explosive dusts)
A	Acetylene	E	Metallic Dusts (all metals)
B	Hydrogen, Ethylene Oxide, Propylene Oxide	F	Carbonaceous Dusts (coal, asphalt, etc.)
C	Ether, Hydrogen Sulfide, Hydrazine, Nitroethane	G	Nonconductive Dusts (grain, drugs, pesticides, plastics, dyes, etc.)
D	Methane, Acetone, Benzene, Gasoline, Naptha		
Summary of NEC Divisions			
Division 1	Potentially explosive substance present under normal operating conditions		
Division 2	Potentially explosive substance present under abnormal operating conditions		

① IP Equivalents are only approximate. It is the responsibility of the user to verify the enclosure rating necessary for the given application.

C0 Starters & Enclosed Products

IP Ratings Definitions

<p>IP Ratings Definitions</p> <p>The first IP number (left side of chart) is protection against solid objects. The second IP number (across top) is protection against liquids. The chart itself shows degrees of protection according to IEC 529.</p>	 No protection IP...0	 Protected against vertically falling drops of water (condensation) IP...1	 Protected against dripping water with enclosure up to 15° from vertical IP...2	 Protected against sprayed water up to 60° from vertical IP...3	 Protected against sprayed water from all directions (limited ingress permitted) IP...4	 Protected against low pressure water jets from all directions (limited ingress permitted) IP...5	 Protected against strong jets of water from all directions IP...6	 Protected against immersion up to one meter IP...7	 Protected against long periods of immersion under pressure IP...8
<p>IP0...</p>  No protection IP00									
<p>IP1...</p>  Protected against solid objects up to 50mm (accidental touch by hands) IP10 IP11 IP12									
<p>IP2...</p>  Protected against solid objects up to 12mm (fingers, knuckles) IP20 IP21 IP22 IP23									
<p>IP3...</p>  Protected against solid objects up to 2.5mm (tools, wires) IP30 IP31 IP32 IP33 IP34									
<p>IP4...</p>  Protected against solid objects up to 1mm (wires) IP40 IP41 IP42 IP43 IP44									
<p>IP5...</p>  Protected against dust (limited ingress permitted) IP50 IP53 IP54 IP55 IP56									
<p>IP6...</p>  Totally protected against dust IP60 IP65 IP66 IP67									

Custom Control Panels

Designed and built to meet *Your* needs

C0

Custom Control Panels

ISO9001, UL508 & UL1203 (NNNY) Certified Panel Shop

Including ATEX Solutions



Need Custom Control Panels? You Got It

Sprecher + Schuh is your go to builder for custom motor control panels. Our panel shops are UL508 and CSA approved. This means our knowledgeable team can design your panel for custom applications to meet UL/CSA, ATEX, UL1203, and CE standards. Our engineering and custom quotes staff work with the customer one-on-one in designing a motor control panel that best fits the customer's needs. No job is too small or too big for our staff to take on.

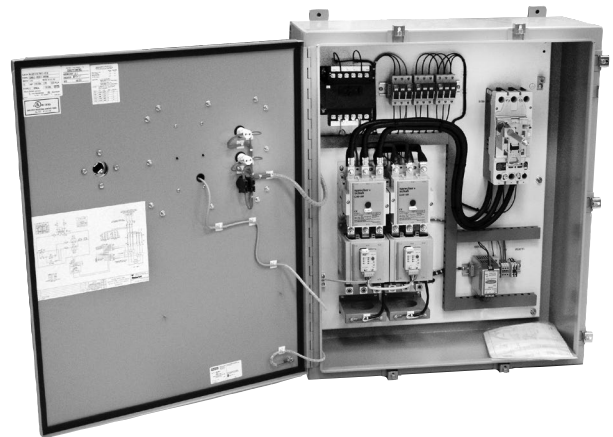
We continuously strive to develop innovative, new products and improve existing designs. We constantly strive to maintain a superior level of service including our ISO 9001 Certification.

Our large panel shop is designed to accommodate our customers' needs. We stock not only Sprecher + Schuh components but also MCCB and popular enclosures in a variety of sizes and types (metallic, non-metallic, and explosion-proof). This means we can design, assemble, wire, and quickly ship a variety of custom panels.



What Can We Build For You?

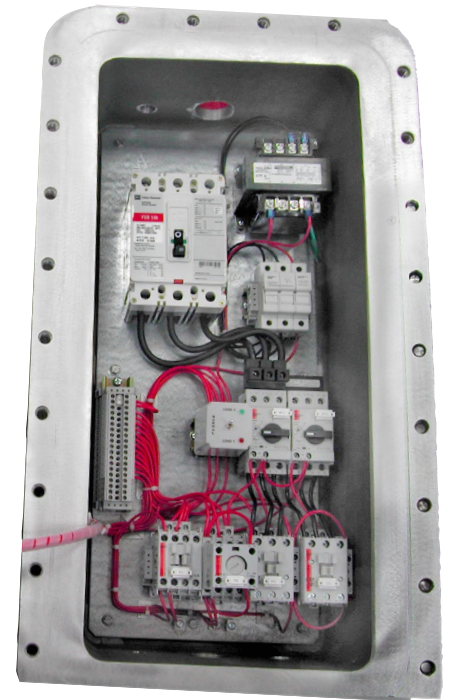
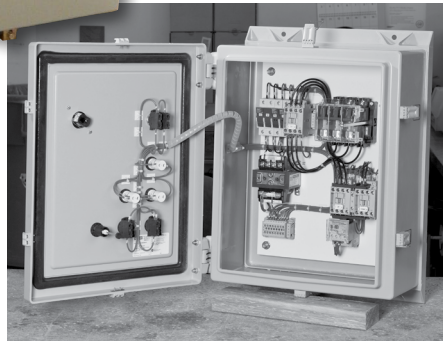
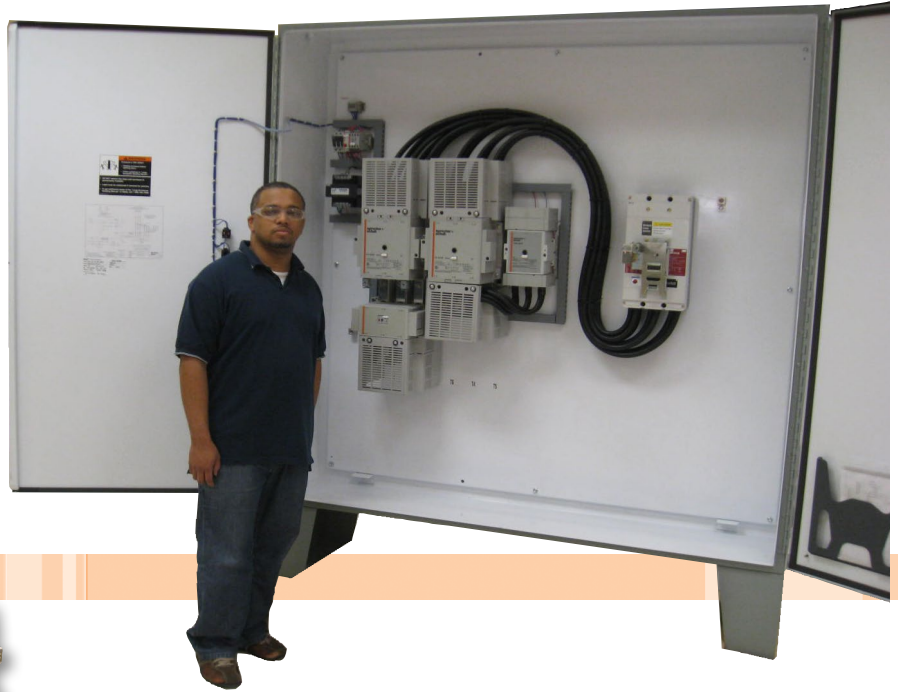
Regardless of your industry or custom control panel needs, we at Sprecher + Schuh have the engineering experience and manufacturing facilities to design and build your panels. Whether your need is to design an OEM panel that will be repeated, or a one-of-a-kind, we have an experienced engineering and quality control team dedicated to providing the best solution to your custom control panels. Our manufacturing facilities are staffed with experienced wiring and installation technicians, ensuring your custom panel meets safety and performance criteria. Through this commitment to service, and never-ending attention to detail, we continue to be the first and last words in motor protection.



Custom Built Panels

Custom built to your specifications!

- Multi-Motor Starter Panels
- Combination & Non-Combination Motor Starters
- Reduced Voltage Starters
- Softstarter Panels (see Section D)
- Multi-plex Pump Panels
- Door-in-Door Panels
- Explosion-Proof Starters
- UL508/CSA Labeled Custom Panels
- ATEX Explosion Proof Panels
- Labeled Service Entrance Rated Panels
- and many more!



For your
**Custom
application**
contact:
customquotes@sprecherschuh.com



