

# PWE/PWVE

Three-Phase Padmounted Reclosers  
The Three Phases of Reliability.



# KYLE® PWE/PWVE THREE-PHASE RECLOSERS

Reliability is as easy as one, two, three with Kyle PWE and PWVE reclosers. These three-phase reclosers provide the ultimate in reliable and economical overcurrent protection for distribution systems utilizing UD cable. PWE and PWVE. From Cooper Power Systems.



15 and 27kV

Improved System Reliability

Distribution Automation

Vacuum Interruption

Microprocessor Controls

Weatherproof



Kyle® type PWE and PWVE padmounted, electronically controlled, three-phase automatic circuit reclosers, provide reliable and economical overcurrent protection for underground distribution systems. Designed for 15 and 27kV installations, PWE and PWVE applications include feeder protection, circuit sectionalizing, loop sectionalizing, and transformer high-side protection. Over 60 years of experience in the design and application of distribution switchgear, make our padmounted reclosers a reliable protection choice for your system. A wide variety of Kyle electronic controls provide flexibility of application, and make it easy to adjust to your distribution automation needs.

PWE and PWVE feature weatherproof and tamper-resistant enclosures, providing an attractive, compact, and secure package for use in substations, commercial and residential areas, and other applications where low-profile construction is required.

#### **Vacuum Interruption**

PWE and PWVE use Kyle vacuum interrupters for fault current interruption, and oil as the

insulating media. The patented axial-magnetic field vacuum interrupter, designed and manufactured by Kyle Distribution Switchgear, is the most advanced vacuum interrupter in the world. This design keeps the arc in an easier-to-interrupt diffuse mode, resulting in less power in the arc that needs to be dissipated. Furthermore, Kyle's patented design uses the entire contact surface, resulting in less contact erosion, and the longest life of any vacuum interrupter in the industry. You can rely on Kyle vacuum interrupters to provide dependable operation for the lifetime of the switchgear.



#### **Deadfront Construction**

The deadfront construction of PWE and PWVE offers a safety factor for the operations personnel, and the general public. Inside, all terminators are covered with insulating rubber, and all internal parts are completely sealed in insulating oil to reduce maintenance. The bushings are compatible with separable deadfront elbow connectors rated for 600 Amp and 15 or 27kV service.

Universal bushing wells are also available, and are compatible with all industry standard plug inserts for load-break and non-loadbreak separable cable connectors rated for 200 Amps. A grounding bus is located near the bottom of the recloser tank for grounding cable terminations and connectors.

**Durable Paint Finish**

Painted with the most advanced coating system in the industry (similar to that used in the automotive industry), PWE and PWVE retain a like-new protective finish through many years of operation. The coating system exceeds the requirements of ANSI 12.28 and C57.12.29.

**Electronic Controls and Distribution Automation**

Whether you need just basic over-current protection, or the most sophisticated feeder re-configuration scheme, Kyle has a control that will meet your system needs and budget.

PWE and PWVE can be supplied with any of the electronic controls used in the overhead reclosers. The **FXB Control** is front-panel programmable and provides basic overcurrent protection and discrete SCADA contacts. The **Form 4C Control** provides the above plus serial communications and analog current metering. The **Form 5 Control** can be used to perform loop automation with the Intelliteam accessory or the Loop Scheme accessory; Form 5 also provides full metering, load profiling, over/under voltage and over/under frequency protection. Finally, the **Form 6 Control** provides the same basic functionality as Form 5, plus, sync-check for co-generation applications,



**FXB Control**



**Form 5 Control**

oscillography for event diagnostics, and the ability to tailor the protection scheme to specific application requirements using the Workbench set-up tool. All controls are provided with a wide variety of TCC curves, and trip settings, to facilitate coordination with other devices.

**Recloser Mechanism**

PWE and PWVE are electronically controlled reclosers.

Three 1000:1 sensing current transformers mounted in the recloser supply fault-sensing information to the electronic control. Signals from the control energize the operating circuits in the recloser and release the stored-energy trip mechanism when an overcurrent occurs.



**Form 4C Control**



**Form 6 Control**

Contact closing energy is provided by a closing solenoid, which is energized by line-to-line connections inside the recloser. This solenoid closes the main contacts of all phases while simultaneously charging the opening springs in preparation for a tripping operation. High-voltage closing solenoids are connected to the system on the source side of the recloser; selection of solenoid voltage rating is based on the system phase-to-phase operating voltage. Low-voltage solenoids can be employed; however, auxiliary voltage must then be supplied to the recloser.

**ANSI Standards**

Kyle reclosers, are designed and built in accordance with ANSI standard C37.60. PWE and PWVE reclosers also meet ANSI C57.12.28 for paint coating, safety labeling requirements, and cabinet security.



## Ratings of PWE/PWVE Padmounted Reclosers

Voltage Ratings	PWE	PWVE
Nominal Voltage Rating, kV .....	14.4	24.9
Rated Maximum Voltage, kV .....	15.5	27.0
BIL, kV .....	95	125
Low Frequency Withstand Voltage (1 min, kV crest) ..	35	40
DC Withstand Voltage (15 min, kV) .....	53	78

Current Ratings	PWE	PWVE
Rated Continuous Current, Amps .....	560	560
Maximum Interrupting Current, kA, (sym.) .....	12	12
Maximum Momentary Current, kA, (sym.) .....	20	20

Mechanical Specifications	PWE	PWVE
Mechanical Life (Minimum Operations) .....	2500	2500
Close Mechanism .....	Solenoid	Solenoid
Open Mechanism .....	Spring-Operated	Spring-Operated
Contact Close Times (cycles) .....	0.75	0.75
Contact Open Times (cycles) .....	0.50	0.50
Total Interrupter Times (cycles) .....	1.5	1.5

### How To Order

To order a basic type PWE recloser for service on a 14.4kV system, the catalog number would be constructed as follows:

**KPWE** Basic letters for type PWE recloser  
 Basic letters for PWVE recloser: PWVE  
**5** Closing coil code number (from table below) for the system  
**KPWE 5** is the catalog number for the basic recloser

Phase-to-Phase Closing Coil Operating Voltage	Coil Code
2.4	1
3.3	10
4.16-4.8	2
6.0	6
7.2-8.32	3
11	9
12-13.2	4
14.4	5
17	12*
20	11*
23-24.9	13*
Low-Voltage Closing Coil	
125 Vdc	7
250 Vdc	8

\*KWPE only

### Accessories

- Bushing Current Transformers: Multi-ratio Current Transformers (600:5 or 1200:5) for operating meters or separate relays.
- Auxiliary Switch: A three-stage auxiliary switch, with (3)a and (3)b contacts, for remote indication of recloser contact position, or switching of other devices.
- Low Voltage dc-closing: Used in loop and load transfer schemes, to operate the recloser from a low voltage dc-power source instead of the primary high-voltage source. The recloser can be operated regardless of which side of the unit is energized. Low Voltage ac-closing is also available.

### Additional Information

PWE, PWVE Reclosers Catalog Section 285-71  
 Form 4C Installation & Operation Manual S280-77-1  
 Form 5 Installation & Operation Manual S280-79-10  
 Form 5 Loop Scheme Manual S280-79-12  
 Form 5 Intelliteam 99012  
 Form 6 Installation & Operation Manual S280-70-3



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