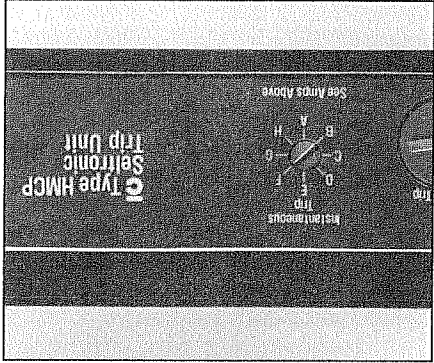


Instantaneous Electronic Trip Unit

The instantaneous Seltronic type elec-
tronic trip unit, used by the 600A HMCP,
provides an adjustable three phase
instantaneous trip setting. The trip range
is a multiple of the continuous current
rating of the breaker. At start-up, an
intentional electronic time delay acts as
an inrush trip suppressor. Any short-
circuit current, however, in excess of a
predetermined level would override the
time delay to provide instantaneous trip-
ping. Figure 13.11

Figure 13.11 HMCP adjustable trip setting.



Push to Trip Mechanism

The push to trip mechanism, an integral
part of the entire Series C family, provides
a means of tripping the HMCP by depres-
sing a button located in the circuit breaker
cover. When the push to trip button is
pressed, a plunger rotates the trip bar
causing the HMCP to trip. Figure 13.12

Trip Setting Adjusting
(Magnetic Mechanism)

The transient inrush trip suppressor acts
as a damping device within the magnetic
type tripping mechanism of an HMCP.
Essentially, it is a tuned spring which
introduces a time delay of approximately
8 ms into the HMCP's trip sequence
under normal conditions and permits a
ride through of the start-up transient
pulse. A true fault current would, however,
supply a magnetic force more than suffi-
cient to override the spring action quickly
and conclude the trip sequence. All type
HMCP F-frame (3-150A) motor circuit pro-
tectors are supplied with a transient
inrush trip suppressor as standard.

Transient Inrush Trip Suppressor

High efficiency motor application and the
reduction of nuisance tripping through
the use of HMCP motor circuit protectors
with transient inrush trip suppressors are
covered in more detail later in this section.

Figure 13.14

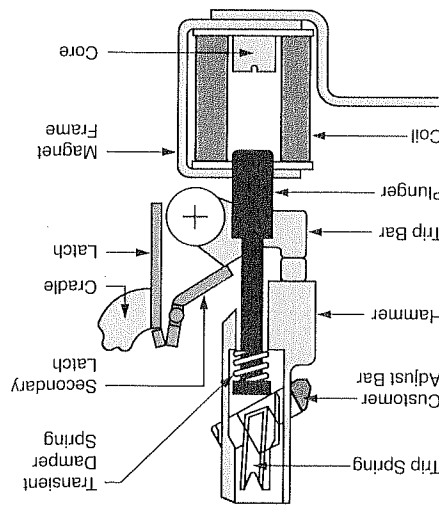


Figure 13.14 HMCP trip mechanism with a
transient damper.

Figure 13.12 The push to trip mechanism
enables manual tripping of breaker by
depressing a button located in the circuit
breaker cover.

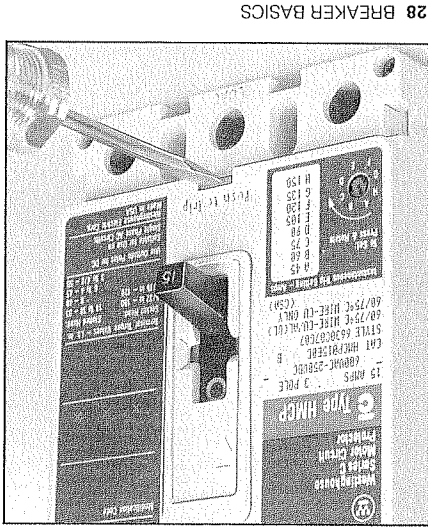
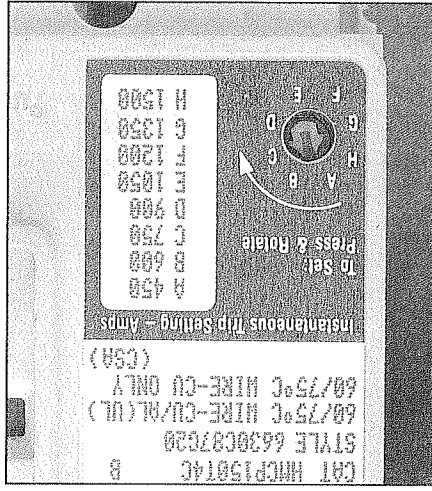


Figure 13.13 A trip setting adjustment allows
level changes from A through H for precise
motor protection.



Applications

HMCP versus Fusible Device

Since the initial stages of MCP develop-
ment, testing and product refinement of
the motor circuit protector has been
ongoing to address the advancements in
motor design. Tests in the Westinghouse
high power laboratory continue to demon-
strate the validity of initial findings. Today,
when typical low level fault current is
applied, the Series C HMCP trips and
clears the fault in less than one cycle. Fast
current and subjected to the same test,
have taken up to 94 cycles to clear, as
illustrated in Figure 13.15. Under normal
practices, fuses are applied at ratings
even higher than 125%.

Single Phasing

A continuing single phasing condition
can lead to severe equipment damage,
because the other two phases are forced
to carry significantly higher currents. The
moving contact arm of the HMCP opens
all phases simultaneously, therefore a
fault or overload on any one pole dis-
connects all phases. It is impossible for
HMCP to operate under a single phase
condition. The converse is true with a
fusible device.

Transient Inrush
and Close Coordination Protection

Higher transient motor starting currents
associated with some high efficiency
motors have created nuisance tripping
problems. The HMCP, with the unique
transient inrush trip suppressor or elec-
tronic time delay, permits a ride through of
the first half cycle peak without sacrificing
sensitive short-circuit protection.

Overall Economics

When the total project requirements are
evaluated, the HMCP provides the most
economical solution. HMCPs consume
less power, normally require less space,
have shorter downtimes, need no main-
tenance and require the smallest amount
of inventory.

Flexibility

An adjustable trip setting by itself makes
the HMCP the most flexible device avail-
able. Numerous accessory items not
available with fuses, such as auxiliary
switches, bell alarms, shunt trips and
undervoltage mechanisms, further solidify
the position of unsurpassed flexibility.

Accuracy and Reliability

The HMCP is tested in accordance with
UL which establishes both initial submittal
and follow-up testing. Additionally, pro-
duction and calibration testing after
manu-
facture further verifies the HMCP's
accuracy and reliability. Fuses cannot be
tested. Their performance relies heavily
on quality control and production checks
during assembly. Also, the effects of age
on a fuse are not known until it is called
upon to operate.

For proper motor protection, a device
specifically engineered for the purpose
should be used, the HMCP motor circuit
protector.

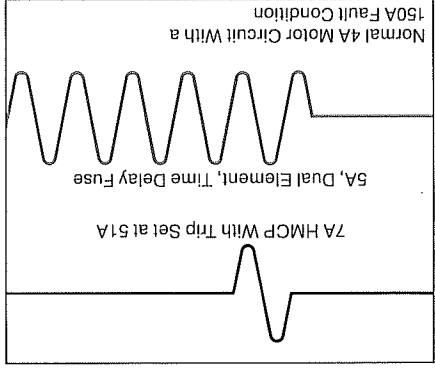


Figure 13.15 Clearing times under like
conditions.