BE1-700V

Digital Voltage/Frequency Protective Relay

DEVICE FUNCTIONS

24	25 Option	27	47
59	60	62	81
79 Option	BESTNet ETHERNET Option	Modbus TCP Option	Modbus RTU Option

The BE1-700V is a compact multifunction numeric relay that provides phase, zero sequence, and negative sequence voltage protection including over and under frequency, plus control and metering functions in an integrated system. Four shot reclosing with separate Pilot Initiate is available as an option. An onboard Ethernet option can provide Modbus/TCP connectivity or can provide web and email capabilities.

WINDOWS® SOFTWARE
Interface for setting and communicating with Basler numeric relays

ADDITIONAL INFORMATION

Instruction Manual
Request publication 9376700990

MODBUS™ Instruction Manual
Request publication 9376700991

ADVANTAGES

• All of the advantages of a fully numeric product in an economical "voltage only" protection package.

• Compact design requires minimal panel space for underfrequency and undervoltage load shedding applications.

• Adds Oscillography, Sequence of Events, and Metering when single function voltage relays are replaced with the BE1-700V.

• Zero sequence voltage (3V0) used to detect single phase ground faults on high resistance or ungrounded systems can be calculated based on the applied 3-phase 4-wire sensing voltage, or applied from a separate zero sequence source (optional VX input).

• With the optional 4-shot recloser, including a pilot initiate path and auxiliary voltage input, replace existing network (transmission, sub-transmission) automatic reclosing schemes.

• BESTlogic provides the user with complete flexibility in configuring a protection and control system.

• Optional BESTNet Ethernet package provides metering and status web pages, settings and configuration via Ethernet, and email notification of user-defined events.

All connections PLUGGABLE!

Basler Electric
w w w . b a s l e r . c o m

ORDERING INFORMATION

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SPECIFICATIONS

BESTlogic

APPLICATIONS

FUNCTIONAL DESCRIPTION

PROTECTION

- Phase Undervoltage and Overvoltage elements: 27P, 127P, 59P, 159P. Elements use a 1 of 3, 2 of 3, or 3 of 3 logic, and monitor either line-line or line-ground voltages.

- Auxiliary Undervoltage and Overvoltage elements: 27X, 59X, 159X. Elements monitor either fundamental or third harmonic on the optional auxiliary 4th VT input, or fundamental phase residual, 3V0, of the phase inputs.

- Overexcitation, volts per Hertz element: 24

- Negative Sequence Overvoltage element: 47

- Over/Under Frequency elements: 81, 181, 281, 381, 481, 581

- Each 81 element can be assigned to monitor 3 phase VT input (VP) or optional Auxiliary voltage input (VX).

- Two general purpose logic timers: 62, 162

- Programmable Logic using BESTLogic

- Two protection setting groups with external or automatic (cold load pickup, load, and unbalance) selection modes

- Sync check with dead line/dead bus voltage monitor logic, 25VM, 24VM (Optional VX)

- Fuse loss detection protects against false trip due to loss of voltage sensing: 60FL

CONTROL

- Optional four shot recloser, including separate pilot and time delayed reclose initiates, with zone sequence coordination and sequence controlled protective element blocking functions.

- Virtual breaker control switch-controllable from both HMI and com. ports: 101

- Two virtual selector switches-controllable from both HMI and com. ports: 43 and 143

- Communication port control of 101, 43, and 143 switches allows for SCADA control of relay and breaker

INSTRUMENTATION

- Real time A, B, C phase voltage and frequency, and calculated neutral and negative sequence voltage

REPORTS

- Breaker operations counter

FAULT RECORDING

- 255 event sequence of events report with I/O and alarm sub-reports

- Fault Reporting; 1 or 2 oscillography records per fault report

- 16 fault summary reports; two most recent Fault Summary Records saved to nonvolatile memory

- Total number of oscillography records settable from 6 to 16

- Total of 240 cycles of oscillography memory @ 12 samples/cycle

- Oscillography records can be stored in COMTRADE 1991 or COMTRADE 1999 formats

COMMUNICATION PORTS

- Two independent general purpose communication ports
  - Front RS-232 ASCII communications
  - Rear RS-485 ASCII or optional Modbus™ protocols

- IRIG-B time sync (demodulated), TTL

- Optional 10/100 BaseT Ethernet port with BESTNet Easy Ethernet or with Modbus/TCP protocol

SELF TEST AND ALARM FUNCTIONS

- Relay fail, major alarm, and minor alarm LEDs, and failsafe alarm output contact

- Extensive internal diagnostics monitor all internal functions of the relay

- More than 20 additional alarm points-programmable for major or minor priority Including:
  - Trip circuit voltage and continuity monitor
  - Close circuit monitor via BESTlogic

PROGRAMMABLE I/O

- Four programmable inputs

- Five programmable outputs and one dedicated programmable alarm output

HARDWARE FEATURES

- Flash Memory for upgrading embedded programming without changing chips

- Integral HMI with 2x16 character display

- Compact panel mount case with integral mounting studs for a clean installation. Less than 3/8" projection in front of panel.

BESTCOMS™ SOFTWARE
Free, easy to use settings program
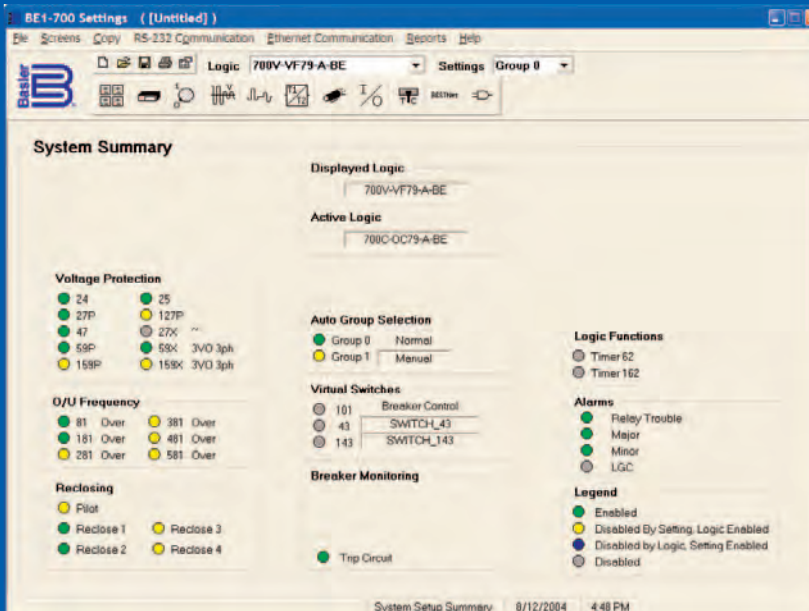
**BESTCOMS Screen, showing at a glance
which relay functions have been enabled**

BESTCOMS allows you to:

- Enter settings and BESTlogic logic equations for the BE1-700
- Save settings to a file
- Save BESTlogic logic schemes (without settings) to a "Logic Library" file
- Print settings
- Upload and download settings via Serial port
- Upload and download settings via Ethernet (with BESTNet option)
- View real-time metering and status when connected to a relay
- View fault records and SER data when connected to a relay
- View COMTRADE oscillographic records (with included BESTwave program)
- FREE! with every order

APPLICATIONS

The BE1-700V Digital Voltage/Frequency Protective Relay provides single and three phase, zero sequence, and negative sequence voltage protection including over and under frequency. Its unique capabilities make it ideally suited for applications with the following requirements. The BE1-700V is intended for use in:

- Applications that require the flexibility provided by wide setting ranges and multiple setting groups.
- Applications that require the economy and space savings provided by a multifunction, multiphase unit. This one unit can provide all of the voltage

protection, as well as local and remote indication, metering, and control functions required on a typical bus, feeder, or line.

- Applications where bus, feeder, or line voltages and frequencies must be monitored.
- Any under or over voltage or frequency protection application, i.e. bus, feeder, line, motor, generator, cogeneration, etc.
- Applications that require a fundamental digital signal processing (DSP) algorithm to provide rejection of harmonics and low transient overreach.

- Applications where the capabilities of intelligent electronic devices (IEDs) are used to decrease relay costs and to protect against abnormal situations.
- Applications that require communication capability.
- Applications using Ethernet communication, programmable email notifications, and live metering information via an embedded web server (with BESTNet option).
- Applications requiring Modbus/TCP Ethernet communications (with Modbus/TCP option).

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FEATURES

ORDERING INFORMATION

FUNCTIONAL DESCRIPTION

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BESTlogic

APPLICATIONS

The BE1-700V is a multifunction, numeric relay that provides a comprehensive mix of protective, control and metering functions in an integrated system. This system is suitable for any voltage and frequency application including bus, feeder, line, generator/motor applications and cogeneration applications.

The unit has one set of three phase and neutral voltage sensing inputs to provide all common protective functions for typical power system voltage and frequency protection applications.

Two independent communications ports, along with built-in support for Modbus™ or Modbus/TCP, provide easy access to integrating the protection, control, metering, and status monitoring functions into a substation automation system. The standard IRIG-B port provides time synchronization from a master clock.

Real time metering provides voltage frequency telemetry for the protection application. Contact sensing inputs and alarm monitoring functions provide real time status information. Remote control is provided by virtual control and selector switches with select-before-operate control of programmable outputs.

BESTlogic

BESTlogic programmable logic provides the user with high flexibility in configuring a protection and control system.

Each of the protection and control functions in the BE1-700V is implemented as an independent function block that is equivalent to its single function, discrete device counterpart. Each independent function block has all the inputs and outputs that the discrete component counterpart might have. Figures 7 and 7a show each of the independent blocks available for use in the BE1-700V. Programming BESTlogic is equivalent to choosing the devices required by your protection and control scheme and drawing schematic diagrams to connect the inputs and outputs to obtain the desired operational logic.

The BE1-700V relay can store, as user settings, one user programmable, custom logic scheme. To save you time, several preprogrammed logic schemes have also been provided. Any of the preprogrammed schemes may be copied into the logic settings without making any additional BESTlogic settings.

BESTlogic provides the protection engineer with the flexibility to set up this powerful multifunction system with the same freedom that was once enjoyed with single function, discrete devices. It is no longer necessary to compromise your standard protection and operating practices to deal with the limitations in programmability of previous multifunction devices.

Figures 1 through 5 show typical external connections, and Figure 6 shows rear panel connections.

Available with BESTNet Easy Ethernet

BESTNet ETHERNET OPTION

The BESTNet option connects your BE1-700V relay to the wired world.

BESTNET features include:

- Embedded web server with metering, status, and fault summary information*

- Email alerts of as many as seven user-defined conditions**

- Full BESTCOMS support over Ethernet

- Full Basler ASCII protocol for terminal mode communications (TELNET) or custom programmed application access

- Support for DHCP or static IP addressing. IP Discovery function included in BESTCOMS.

* *A web browser with a Java™ Runtime environment installed is required to view web pages.*

** *An external SMTP email server must be available to use email alerts.*

Sample BESTNet Web Page

Modbus/TCP ETHERNET OPTION

Instead of the BESTNet option, the BE1-700 can be ordered with the Modbus/TCP option. With Modbus/TCP, your BE1-700 relay offers a true Modbus/TCP protocol connection via an internal 10/100 BaseT port. No clumsy external adaptors are required! Simply plug in an Ethernet cable and your BE1-700 is part of your Modbus/TCP network.

NOTE: Modbus/TCP and BESTNet are mutually exclusive. The Ethernet port can be used for BESTNet or Modbus/TCP, but not both.
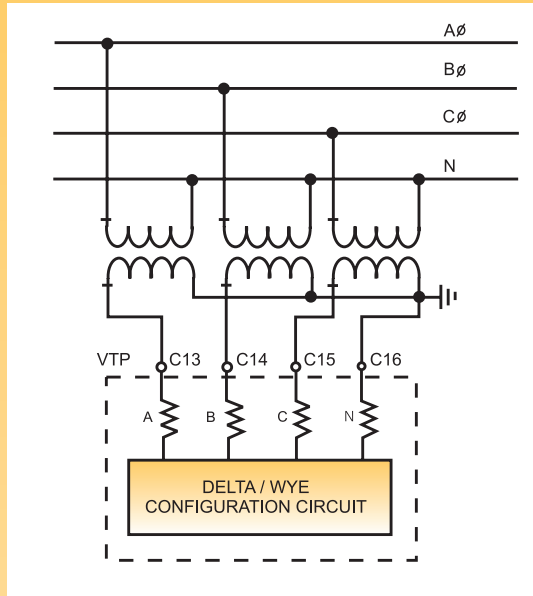
A) 3 Phase VT 4 Wire Connection
Provides 3 element metering; 27P and 59P can be
P-N or P-P.
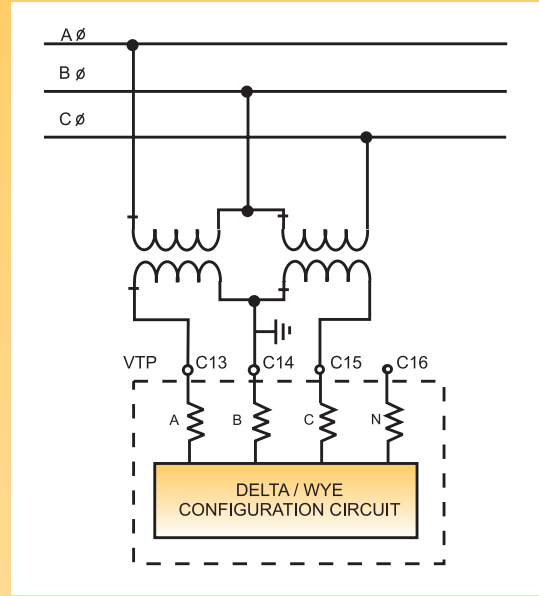
B) 3 Phase VT 3 Wire Connection
Provides 2 element metering; 27P and 59P can be
P-N or P-P; 59N ($3E_0$) is disabled.
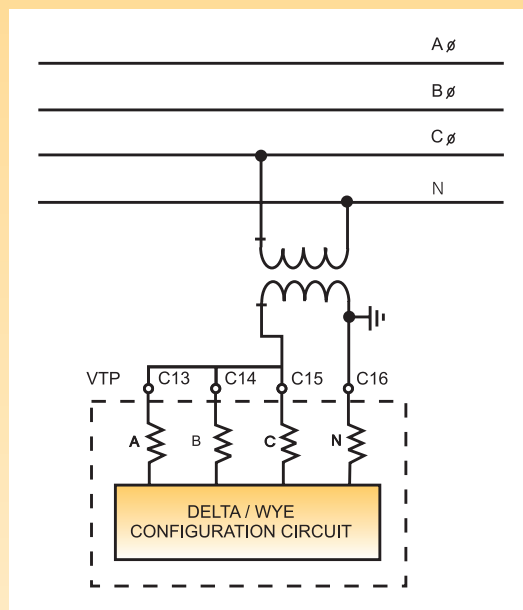
C) 1 Phase VT L-N Connection
VT primary can be connected to any phase, A-N, B-N,
C-N. One element metering; 47(V2) and 59N($3E_0$)
disabled; 27P and 59P are P-N.
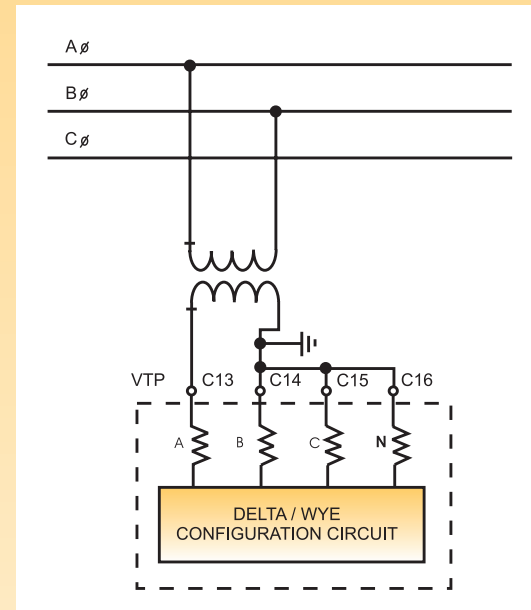
D) 1 Phase VT L-L Connection
VT primary can be connected to any phase, A-B, B-C,
C-A. One element metering (-30 degrees); 47(V2) and
59N($3E_0$) disabled; 27P and 59P are P-P.

Figure 1 – Accommodates a Variety of Common Voltage Connections

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TYPICAL APPLICATION FOR THE BE1-700V WITH RECLOSING OPTION
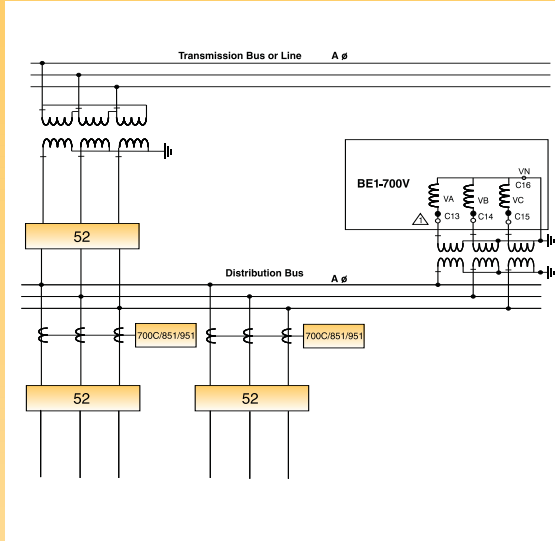
Figure 2 – Bus Voltage Protection including UF Load Shed
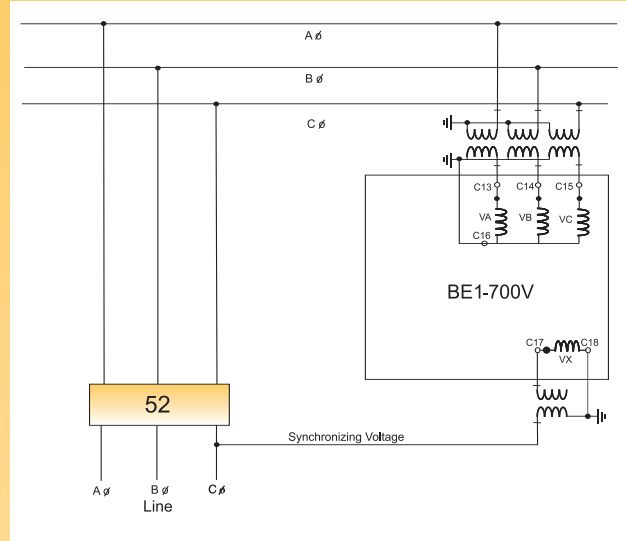
Figure 3 – Network Reclosing Application
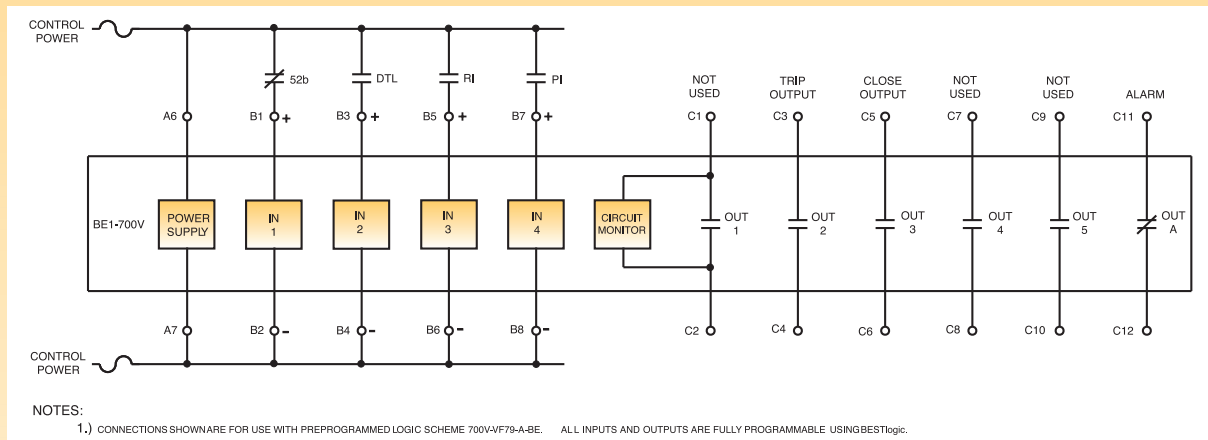
NOTES:
1.) CONNECTIONS SHOWN ARE FOR USE WITH PREPROGRAMMED LOGIC SCHEME 700V-VF79-A-BE.   ALL INPUTS AND OUTPUTS ARE FULLY PROGRAMMABLE USING BESTlogic.

Figure 4 – Typical External Connections

BE1-700V

Digital Voltage/Frequency
Protective Relay

APPLICATIONS | BESTlogic | FUNCTIONAL DESCRIPTION | SPECIFICATIONS | ORDERING INFORMATION | FEATURES
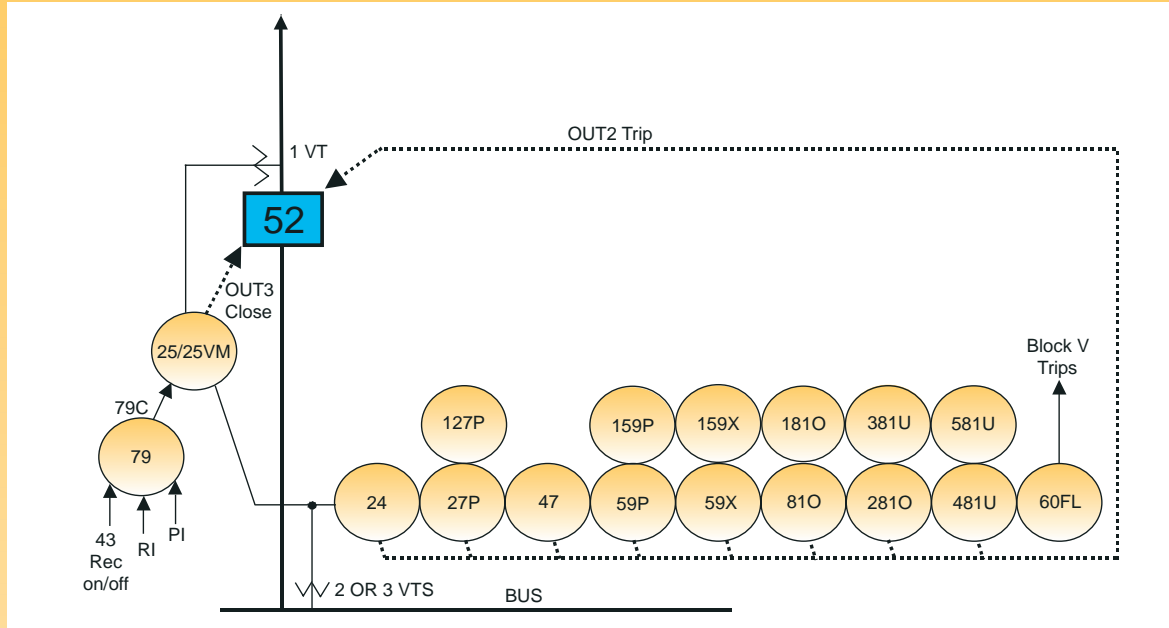
Figure 5 – Typical Application Single Line

Figure 6 – BE1-700V Voltage/Frequency Relay Rear Panel Connections

Pluggable Connectors

Each rear panel terminal block may be unplugged after removing its two mounting screws. This allows prewiring of terminal blocks or replacement of the relay without wiring changes.

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BESTlogic

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FUNCTIONAL DESCRIPTION

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RELAY FUNCTIONS

| HMI | ○ ARSTKEY |
| | ○ TRSTKEY |

SETTING GROUP CONTROL

Mode =
0-disable
1-discrete select
2-binary select

D0
D1

| ACTIVE SETTING GROUP CONTROL | ○ SG0 |
| | ○ SG1 |

VOLTAGE ELEMENTS

VOLTS PER HERTZ (24) — ○ 24T / ○ 24PU

SYNC CHECK WITH VOLTAGE MONITOR (25) — ○ 25 / ○ 25VM1

Mode =
0-disable
1-1 of 3
2-2 of 3
3-3 of 3
BLK
PHASE UNDER-VOLTAGE (27P) — ○ 27PT / ○ 27PPU

Mode =
0-disable
1-1 of 3
2-2 of 3
3-3 of 3
BLK
PHASE UNDER-VOLTAGE (127P) — ○ 127PT / ○ 127PPU

Mode =
0-disable
1-1 of 3
2-2 of 3
3-3 of 3
BLK
PHASE OVER-VOLTAGE (59P) — ○ 59PT / ○ 59PPU

Mode =
0-disable
1-1 of 3
2-2 of 3
3-3 of 3
BLK
PHASE OVER-VOLTAGE (159P) — ○ 159PT / ○ 159PPU

Mode =
0-disable
1-1st harm Aux VT
2-calc 3Vo
3-3rd harm Aux VT
BLK
AUXILIARY UNDER-VOLTAGE (27X) — ○ 27XT / ○ 27XPU

Mode =
0-disable
1-1st harm Aux VT
2-calc 3Vo
3-3rd harm Aux VT
BLK
AUXILIARY OVER-VOLTAGE (59X) — ○ 59XT / ○ 59XPU

Mode
BLK
AUXILIARY OVER-VOLTAGE (159X) — ○ 159XT / ○ 159XPU

Mode =
0-disable
1-enable
BLK
NEGATIVE SEQUENCE OVER-VOLTAGE (47) — ○ 47T / ○ 47PU

Mode =
0-disable
1-Enabled on Vp input
X-Enabled on VX input
BLK
OVER/UNDER FREQUENCY (81) — ○ 81T

Mode
BLK
OVER/UNDER FREQUENCY (181) — ○ 181T

Mode
BLK
OVER/UNDER FREQUENCY (281) — ○ 281T

Mode
BLK
OVER/UNDER FREQUENCY (381) — ○ 381T

Mode
BLK
OVER/UNDER FREQUENCY (481) — ○ 481T

Mode
BLK
OVER/UNDER FREQUENCY (581) — ○ 581T

RECLOSE ELEMENTS

OPTIONAL

Mode
0-Disable
1-PowerUp to Lockout
2-PowerUp To Close

RI
STATUS
WAIT
BLK/DTL
PI

79 RECLOSER	○ 79P
	○ 79C
	○ 79LO
	○ 79RNG
	○ 79RST
	○ 79SCB

TIMER ELEMENTS

Mode =
0-disable
1-pu/dropout
2-1shot nonretrig
3-1shot retrig
4-oscillator
5-integrating
6-latch

INI
BLK

62 TIMER — ○ 62

Mode
INI
BLK
162 TIMER — ○ 162

Figure 7 – BE1-700V BESTlogic Function Blocks

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BE1-700V

Digital Voltage/Frequency Protective Relay

FUNCTIONAL DESCRIPTION

BESTlogic

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ALARM FUNCTIONS

BKR CLOSED → SB-LOGIC COMMAND → BREAKER STATUS MONITOR /1\ → OUT1MON

SG-TRIGGER COMMAND [TRIP / PU / LOGIC] → FAULT REPORTING FUNCTION /1\

RESET → SG-TARG SETTING → TARGET REPORTING FUNCTION /1\

RESET → SA-ALARM SETTING → ALARM REPORTING FUNCTION /1\

INPUT/OUTPUT

+ / − OPTO ISOLATION → IN1
+ / − OPTO ISOLATION → IN2
+ / − OPTO ISOLATION → IN3
+ / − OPTO ISOLATION → IN4

CONTROL SWITCHES

Mode = 0-disable 1-on/off/pulse 2-on/off 3-off/momentary → 43 AUX SWITCH → 43
CO-43 = 0-off 1-on P-pulse → 43 AUX SWITCH

Mode → 143 AUX SWITCH → 143
CO-143 = → 143 AUX SWITCH

Mode = 0-disable 1-enable → 101 BREAKER CONTROL SWITCH → 101T, 101C, 101SC
CO-101 = T-trip C-close → 101 BREAKER CONTROL SWITCH

BESTNet ELEMENTS

OPTIONAL

EMAIL1, EMAIL2, EMAIL3, EMAIL4, EMAIL5, EMAIL6, EMAIL7

LOGIC ELEMENTS

VOA, CO-OUTA= 0 - off 1 - on P - pulse L - logic → OUTPUT LOGIC → OUT A

VO1 / CO-OUT1 → OUTPUT LOGIC → OUT1
VO2 / CO-OUT2 → OUTPUT LOGIC → OUT2
VO3 / CO-OUT3 → OUTPUT LOGIC → OUT3
VO4 / CO-OUT4 → OUTPUT LOGIC → OUT4
VO5 / CO-OUT5 → OUTPUT LOGIC → OUT5

NOTES

/1\ Not included in BESTlogic settings.

/2\ Under/Over is setting parameter for all 81 elements.

/3\ Each frequency element can be assigned to monitor 3Ø VT input (VP) or optional Auxiliary VT input (VX).

/4\ Optional VX input cannot support simultaneous monitoring of two different voltage sources: i.e., a 25-VX (bus or line VT) source and a 59N-VX (broken delta) source cannot be simultaneously applied to the VX input. The user must choose one application at a time for the VX input.

Figure 7A – BE1-700V BESTlogic Function Blocks

GENERAL SPECIFICATIONS

PHASE AC VOLTAGE INPUTS

Continuous: 300V, Line to Line
One Sec. rating: 600V, Line to Neutral
Burden: Less than 1VA @ 300Vac

AUXILIARY AC VOLTAGE INPUT

Continuous: 150V
One Sec. rating: 600V
Burden: Less than 1VA @ 150Vac

A/D CONVERTER

Sampling Rate: 12/cycle, adjusted to input frequency 10-75Hz

POWER SUPPLY

Option 1: 48VDC
Option 2: 120VAC, 125VDC
Option 3: 24VDC
Option 4: 240VAC, 250VDC
Burden: 6 W continuous, 8 W maximum with all outputs energized

OUTPUT CONTACTS

Make and carry: 30A (0.2sec)
Continuous: 7A
Break: 0.3A DC (L/R=0.04)

CONTROL INPUTS

Wetting voltage range:

Power Supply Option	Turn-on Voltage Range (VDC)	Burden
1) 48 Vdc	26-38 V	23 k ohms
2) 120 Vac/125 Vdc	69-100 V	53 k ohms
3) 24 Vdc	5-8 V	6 k ohms
4) 240 Vac/250 Vdc	138-200 V	123 k ohms

Control inputs recognize both DC and AC voltages.

SERIAL COMMUNICATION PORTS

Response Time: <100mSec for metering and control functions
Baud Rate: 300-19200
Protocols: Front RS-232: ASCII
Rear RS-485: ASCII standard, Modbus optional

ETHERNET PORT (OPTIONAL)

Type: 10/100 BaseT, RJ-45 connector

Protocols: BESTNet or Modbus/TCP, see Page 4

MECHANICAL ENVIRONMENT

• Operating temperature range: -40°C to 70° C (-40°F to 158°F)*
• Storage temperature range: -40°C to 70°C (-40°F to 158°F)

* Display contrast may be impaired below -20°C.

CONFORMS TO STANDARDS:

• IEC 1000-4-2 (EN 61000-4-2) Electrostatic Discharge Immunity

• IEC 1000-4-3 (EN 61000-4-3) Radiated RF Immunity

• IEC 1000-4-4 (EN 61000-4-4) Electrical Fast Transient

• IEC 1000-4-5 (EN 61000-4-5) Surge-Lightning Strikes

• IEC 1000-4-6 (EN 61000-4-6) RF Conducted

• IEC 1000-4-8 (EN 61000-4-8) Power Freq. Magnetic Field

• IEC 1000-4-11 (EN 61000-4-11) Voltage Dips and Interruptions

• IEC 255-5: 1977 Insulation Tests For Relays

• IEC 255-11: 1979 Interruptions to and AC (Ripple) in DC

• IEC 255-22-1: 1988 1MHz Burst Disturbance

• IEC 255-22-2: 1996 Electrostatic Discharge

• IEC 255-22-3: 1989 Radiated Disturbance

• IEC 255-22-4: 1992 Fast Transient Disturbance

• IEEE C37.90.1: 2002 Surge Withstand Capability

• IEEE C37.90.1: 2002 Surge Withstand Capability

• IEEE C37.90.2: 1995 Radiated Electromagnetic Interference

• IEC 68-2-1: 1990 Test A. Cold

• IEC 68-2-2: 1974 Test B. Dry Heat

• IEC 68-2-3: 1969 Test Ca. Damp Heat

• IEC 68-2-30: 1980 Damp Heat Cyclic 12+12 Hour

• IEC 68-2-56: 1988 Damp Heat Steady State

• IEC 255-21-1 Vibration Tests

• IEC 255-21-2 Shock and Bump Tests

CERTIFICATIONS

• UL recognized per Standard 508 and Standard CAN/CSA-C22-2 Number 14-M91, UL File Number E97033.
• GOST-R certified per the relevant standards of Gosstandart of Russia.
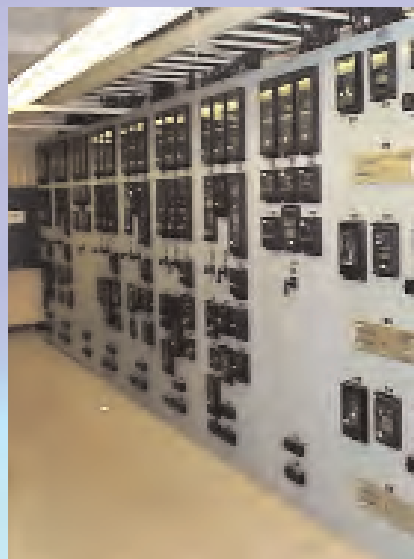• Byelorussian certified.

CASE SIZE

10.5" wide, 4.46" high, 7.81" behind panel (.29" front projection) (266.7 mm wide, 113.23 mm high, 198.49 mm behind panel; 7.38 mm front projection)

SHIPPING WEIGHT

4.33 pounds (1.96 kg) maximum

WARRANTY

7 years

PERFORMANCE SPECIFICATIONS

VOLTS/HZ (24)

Pickup: 0.5 – 6V/Hz
Delay Time: Inverse Squared Curve

$$T_T = \frac{D_T}{(M-1)^2}$$

$$T_R = D_R \times FST \times 100$$

T_T = Time to Trip T_R = Time to Reset
D_T = Time Dial, Trip D_R = Time Dial, Rest

$$M = \frac{Actual\ V/Hz}{Pickup\ V/Hz}$$ ET = Elapsed Time

FST = Full Scale Trip Time (T_T)

SYNC CHECK (25)

Delta Phase Angle: 1 – 99 degrees
Delta Voltage Magnitude: 1 – 20V
Delta Frequency: 0.01 – 0.50Hz

SYNC CHECK, VOLTAGE MONITOR (25VM)

Dead Threshold: 10 – 150V
Live Threshold: 10 – 150V
Dropout Time Delay: 0.050 – 60.0sec
Logic: Dead Phase/Dead Aux.
Dead Phase/Live Aux.
Live Phase/Dead Aux.

PHASE OVER/UNDERVOLTAGE
(27P, 59P, 127P, 159)

Mode: 1 of 3; 2 of 3; 3 of 3
Pickup: 10.0-300V_{L-L} or 10.0-300V_{L-N}
Delay Time: 0.050 – 600 sec.

NEGATIVE SEQUENCE OVERVOLTAGE (47)

Pickup: 1.0 – 300V_{L-N}
Delay Time: 0.050 – 600sec.

AUXILIARY / 3V0 OVER/UNDERVOLTAGE
(27X, 59X, 159X)

Mode: Fundamental V_x, 3 phase Residual
(3V0), 3rd Harmonic V_x
Pickup: 1.0 – 150V
Delay Time: 0.050 – 600 Sec.

GENERAL PURPOSE LOGIC TIMERS (62, 162)

Mode: PU/DO
1 Shot, Non-Retrig.
1 Shot, Retrig.
Integrating
Latch
T1 and T2 Delay Time: 0.000 – 9999 Sec.
Time Accuracy: $\pm$0.5% or $\pm^3/_4$ cyc

RECLOSER (79)

Mode: Power up to close, Power up to lockout
Reclose Attempts: 0 – 4 Total Reclose Attempts
1 Pilot or Delayed Reclose
3 Additional Delayed Recloses

Reclose, Reset, Fail,
Max. Cycle Timers: 0.100 – 600 Sec.
Time Accuracy: $\pm$0.5% or $+1^3/_4$ cyc/-0 cyc

VOLTAGE PICKUP ACCURACY (All 27, 47 and 59)

Phase (V_{L-L} or V_{L-N}): $\pm$2% or $\pm$0.5V
Phase 3V0 and V2: $\pm$2% or $\pm$0.5V

DEFINITE TIME ACCURACY
UNLESS OTHERWISE STATED (All 27, 47 and 59)

Definite Time Accuracy: $\pm$0.5% or $\pm$1 cyc

SETTING GROUPS

Setting Groups: 2
Control Modes: Automatic: CLP; Dynamic load or
unbalance
External: Discrete input logic;
Binary: Input Logic

METERING

Phase Voltage Range: 3W 0 – 300V_{L-L}
4W 0 – 300V_{L-L}

Phase Voltage Accuracy: $\pm$0.5% for 50V<V_{L-L}<300V
Frequency: 10 – 75Hz
Frequency Accuracy: 0.01Hz

BREAKER MONITORING

Op Counter Alarm Range: 0 – 99999

FREQUENCY (81, 181, 281, 381, 481, 581)

Mode: Over, Under
Pickup (O/U): 20.00-70.00Hz
Over/Undervoltage Inhibit: 15-150V
Delay Time: 0.000-600 sec.
Time Accuracy: $\pm$0.5% + 1 cyc/-0cyc (min. trip time
affected by min. 3 cycle security count)

GUIDEFORM SPECS

Available on e-catalog CD,
online at www.basler.com,
or from your representative

FUNCTIONAL DESCRIPTIONS

SPECIFICATIONS

APPLICATIONS

BESTlogic

ORDERING INFORMATION

FEATURES

SAMPLE STYLE NUMBER

The style number identification chart below defines the electrical characteristics and operation features included in the BE1-700V relay. For example, if the style number were BE1-700 N4R4X5N, the device would have the following:

BE1-700 Digital Protective Relay
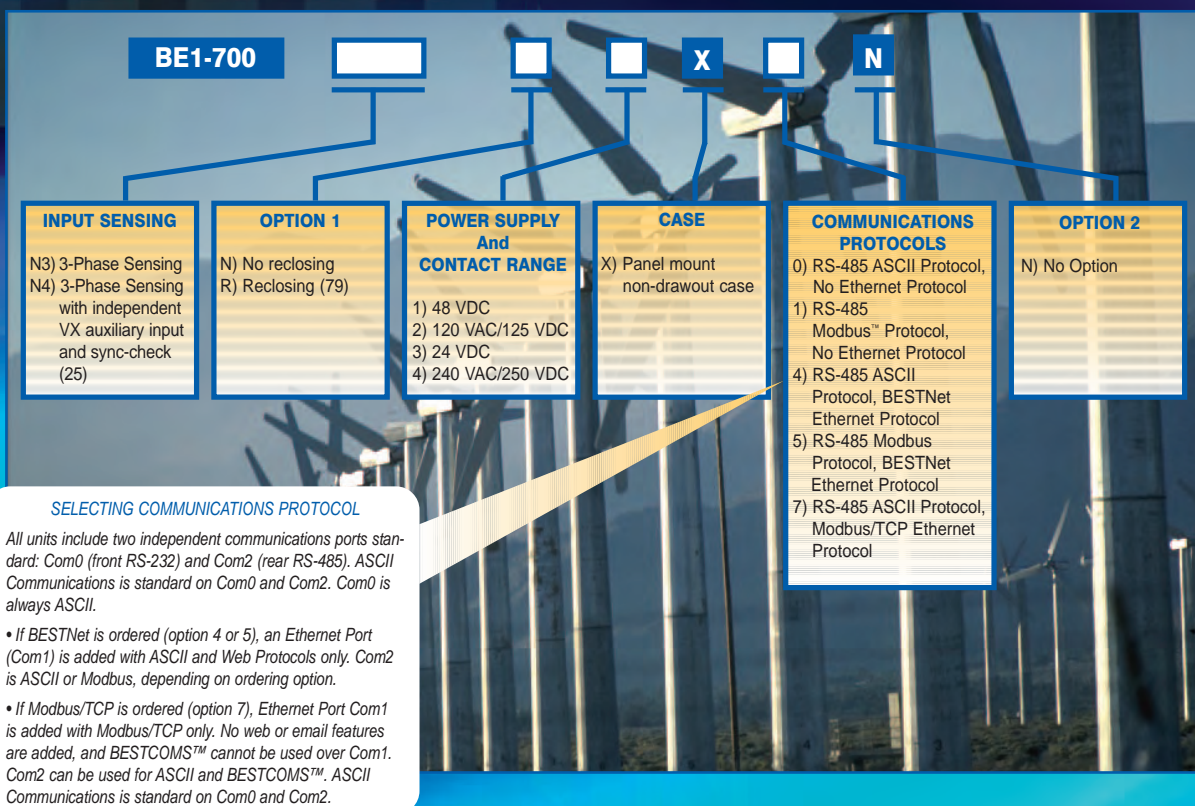**(N4)** – 3-phase Sensing with Independent Auxiliary Input and sync-check
(R) – Reclosing
(4) – 240 VAC/250 VDC Power Supply
(X) – Panel mount, non-drawout case
(5) – Modbus on RS-485 port, BESTNet Ethernet protocol
(N) – Not applicable

| BE1-700 | | | | X | | N |

INPUT SENSING	OPTION 1	POWER SUPPLY And CONTACT RANGE	CASE	COMMUNICATIONS PROTOCOLS	OPTION 2
N3) 3-Phase Sensing N4) 3-Phase Sensing with independent VX auxiliary input and sync-check (25)	N) No reclosing R) Reclosing (79)	1) 48 VDC 2) 120 VAC/125 VDC 3) 24 VDC 4) 240 VAC/250 VDC	X) Panel mount non-drawout case	0) RS-485 ASCII Protocol, No Ethernet Protocol 1) RS-485 Modbus™ Protocol, No Ethernet Protocol 4) RS-485 ASCII Protocol, BESTNet Ethernet Protocol 5) RS-485 Modbus Protocol, BESTNet Ethernet Protocol 7) RS-485 ASCII Protocol, Modbus/TCP Ethernet Protocol	N) No Option

SELECTING COMMUNICATIONS PROTOCOL

All units include two independent communications ports standard: Com0 (front RS-232) and Com2 (rear RS-485). ASCII Communications is standard on Com0 and Com2. Com0 is always ASCII.

• If BESTNet is ordered (option 4 or 5), an Ethernet Port (Com1) is added with ASCII and Web Protocols only. Com2 is ASCII or Modbus, depending on ordering option.

• If Modbus/TCP is ordered (option 7), Ethernet Port Com1 is added with Modbus/TCP only. No web or email features are added, and BESTCOMS™ cannot be used over Com1. Com2 can be used for ASCII and BESTCOMS™. ASCII Communications is standard on Com0 and Com2.

ISO9001-2000
Highland, IL USA   Taylor, TX USA
Wasselonne, France   Suzhou, China

Basler Electric

Route 143, Box 269, Highland, Illinois U.S.A. 62249
Tel +1 618.654.2341 Fax +1 618.654.2351
e-mail: info@basler.com

P.A.E. Les Pins, 67319 Wasselonne Cedex FRANCE
Tel +33 3.88.87.1010 Fax +33 3.88.87.0808
e-mail: beifrance@basler.com

No. 1300 North Zhongshan Road, Wujiang Economic Development Zone
Suzhou, Jiangsu Province - P.R. China 215200
Tel +86(0)512 6346 1730 Fax +86(0)512 6346 1760
e-mail: beichina@basler.com

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