Unelec
Industrial Breakers

New

Spectronic SPN

Air Circuit Breaker

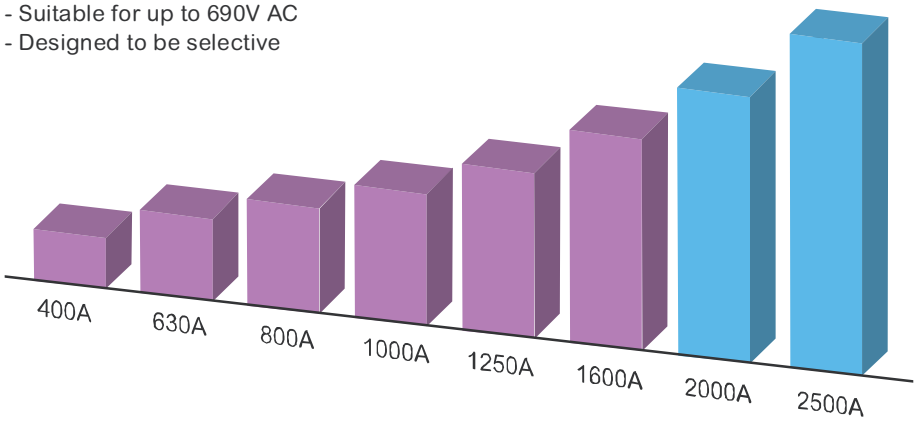
Air Circuit Breakers

New SPN Air Circuit Breakers

- Easy replacement with old SP series
- Designed for simplicity
- Microprocessor based protection

Range and performance

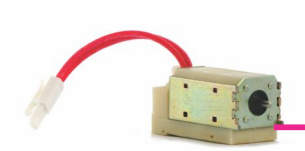
- 400 to 2500A in 2 frame sizes
- Designed to and meets the IEC 60947
- 3P and 4P versions in fixed and withdrawable configurations
- Choice of MTS, MTU or MTL protection unit
- High breaking (Icu) capacity
- Suitable for up to 690V AC
- Designed to be selective



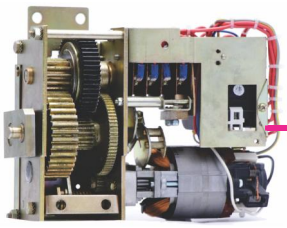
Frame size 1
Frame size 2

Installation

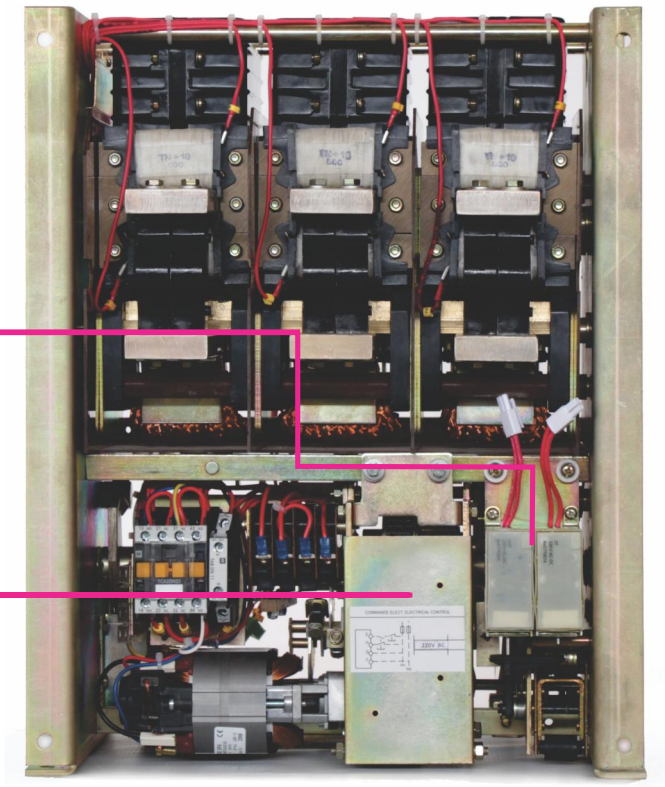
- Solid design and modular build
- No derating up to an ambient of 50°C
- Front and back mounted accessories
- 3 types of trip unit, MTS, MTU and MTL



Voltmetric Releases



Motor operator

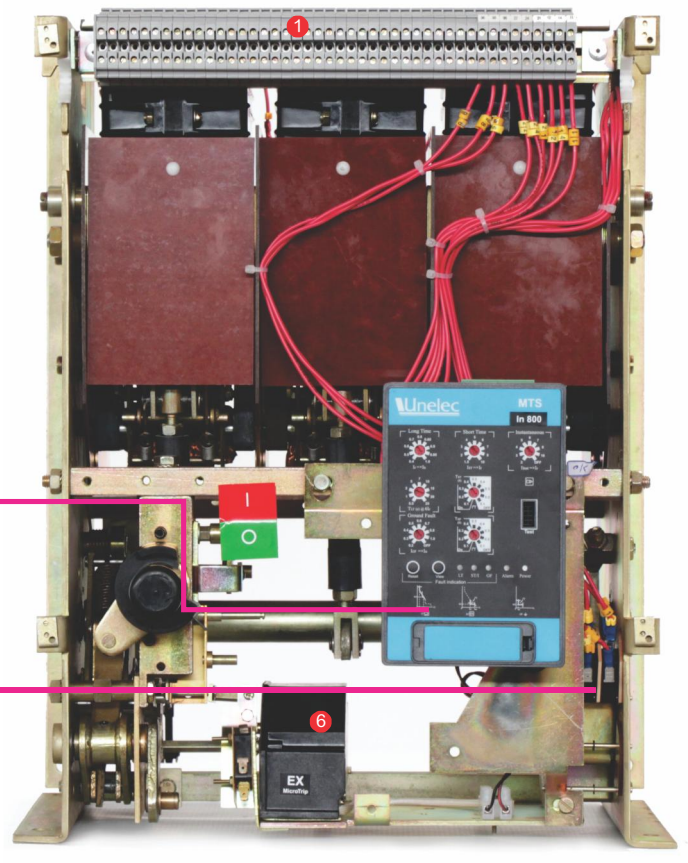


Protection

- Micro-processor based trip unit
- TRUE-RMS sensing
- Standard large LCD display with backlit (MTL)
- Touch-pad based programming navigation
- High accuracy
- Standard event logger and diagnostics
- Simple and easy to operate MTU and MTS trip units by adjustable settings with selectors

Trip unit

AS contcat

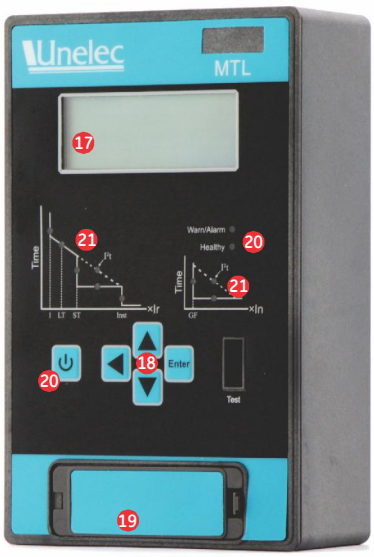


Spectronic SPN

Front fascia

1. Accessories wiring terminals(see page 3)
2. Microprocessor based trip unit
3. Manual charging handle
4. Local trip and reset push button (BPDL)
5. Contact indicator (Red=closed, Green=open)
6. EX trip actuator(see page 3)
7. Locking in “connected” or in “withdrawn” position
8. Operation counter(internally in MTL)
9. Padlock slot for manual trip security
10. Mechanical position indicator (position contact)
11. Arc Chute
12. Racking handles
13. IsolatingShutter
14. Reinforced ground plug(optional)
15. Manual charging handle storage hole(see page 5)
16. Trip unit door lock

MT- Protection trip unit



Advanced electronic trip unit

17. LCD screen with following menu options(MTL):
    - **Setup**
      Allows adjustment of values and settings of all parameters
    - **Meter**
      An ammeter is available on all 3 phases and neutral
    - **Status**
      Breaker in Alarm / Trip position
    - **Events**
      Trip history with the fault indication

18. 3 setting and 1 enter key to access trip unit functionality(MTL)
19. Battery case door (9V alkaline battery)
20. Power on/off key
21. Alarm/warning and Healthy LED
22. Fault indication LED
23. LT,LTD,ST,STD,I and GF setting selectors

Trip features

The Spectronic SPN is a new Air Circuit Breaker developed as a global product meeting IEC 60947-2 standard.
The SPN breaker is a line of three and four pole devices ranging from 400A to 2500A in two frame sizes with fault interruption ratings of 55 (frame 1) and 60kA (frame 2).

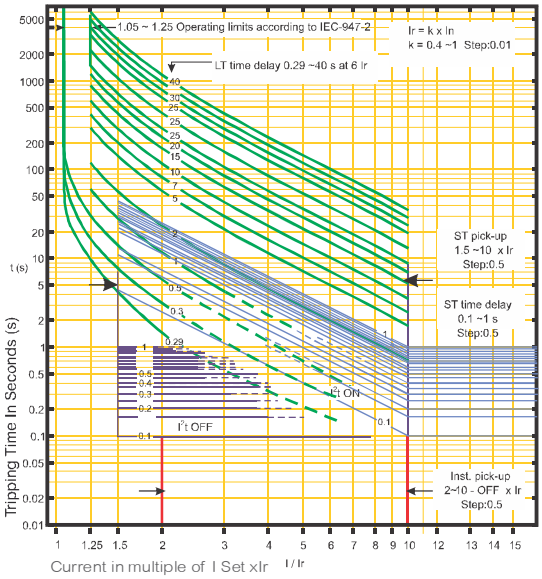
The design offers a unique combination of high fault current withstand ratings, short fault interruption times and selectivity.

The device includes a new state-of-the-art highly accurate trip unit that enables the circuit breaker to reliably protect itself and it's environment.

These SPN Circuit Breakers are designed to allow multiple interruptions of fault currents and can be used in AC networks with voltages up to 690V (optional).

Selective and fast

Spectronic SPN has been designed to offer an uncompromising combination of a high speed interruption at high fault levels. Values of 90 milliseconds or less can be achieved whilst maintaining selectivity.
The circuit breaker is designed to remain closed on a fault as per user settable time value when the fault level lies within the range of short time delay option, and for 30 milliseconds when the fault level attains instantaneous protection range value.
This instantaneous device includes programming that in normal circumstances waits until the downstream breaker trips.



Complete protection

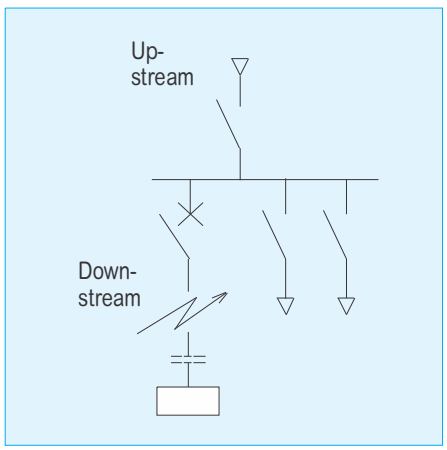
With MTS or MTU or MTL you will have complete protections against overload (LT,LTD), short circuit (ST, STD, I) and ground (GF, GFD) faults.

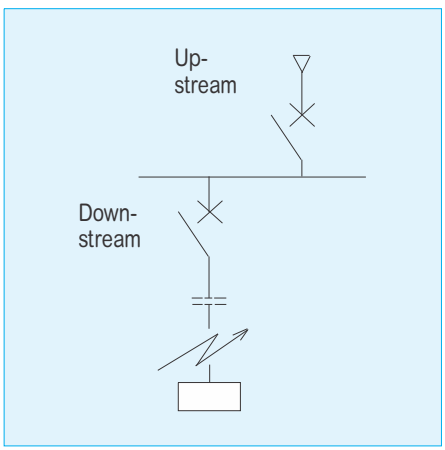
1. Overload protection (LT) with 16 bands
2. Timed short-circuit protection (STD) with 17 bands
3. Selective instantaneous protection (I)

There is selectivity in an installation, when the protection device nearest to the fault operates, leaving all other circuits working normally.

Selectivity
There is full selectivity when selectivity is insured in triphase short-circuit on the outgoing terminals. (This case is extremely rare).

Service selectivity (realistic situation) in case of short-circuit at the end of cables or ducts.





EN 60947-2 standard

Circuit Breaker type			SPN400	SPN630	SPN800	SPN1000	SPN1250	
Poles		Number of	3,4	3,4	3,4	3,4	3,4	
Rated insulation voltage		Ui (Volts)	1000	1000	1000	1000	1000	
Rated impulse withstand voltage		Uimp [Kilovolt]	8	8	8	8	8	
Rated operational voltage Ue		Volts AC	690	690	690	690	690	
Category of use			B	B	B	B	B	
Suitable for use as a isolator		visible breaking indication	YES	YES	YES	YES	YES	
Rated current In		A at 40/50 °C	400	630	800	1000	1250	
		A at 60 °C	400	630	800	1000	1250	
Ultimate breaking capacity Icu (kA)	50/60Hz	230/440V AC	55	55	55	55	55	
		500V AC	35	35	35	35	35	
		690V AC(1)	40	40	40	40	40	
Service breaking capacity Ics (kA)	50/60Hz	230/440V AC	50	50	50	50	50	
		500V AC	35	35	35	35	35	
		690V AC(1)	40	40	40	40	40	
Interruption time		ms	90	90	90	90	90	
Short-circuit withstand Icw (kA)		1 second at 415V AC	50	50	50	50	50	
		1 second at 500V AC	35	35	35	35	35	
Short-circuit making current Icm 220-500V AC		kA Peak	120	120	120	120	120	
Power dissipation (withdrawable, 3 poles)		W	110	120	150	200	300	
4th pole conventional thermal current		A	400	630	800	1000	1250	
Mechanical endurance		With maintenance	10,000	10,000	10,000	10,000	10,000	
Electrical endurance (at 415V AC)(2)		With maintenance	10,000	10,000	10,000	10,000	10,000	
Mean time between maintenances		# operating cycles	1,500	1,500	1,500	1,500	1,500	

(1) On request
(2) To guarantee this number of operations, it is necessary to check the spark arrestors and the arc chutes as shown in the table above (Replace them when necessary)
(3) Neutral reduced to the left.

Microprocessor Trip Unit(4)

MTL with LCD	LT, ST, I, GF	Possible	Possible	Possible	Possible	Possible	
MTS	LT, ST, I, GF	Possible	Possible	Possible	Possible	Possible	
MTU	LT, ST, I, GF	Possible	Possible	Possible	Possible	Possible	

(4) To compare MTL,MTS and MTU please see also page 17.

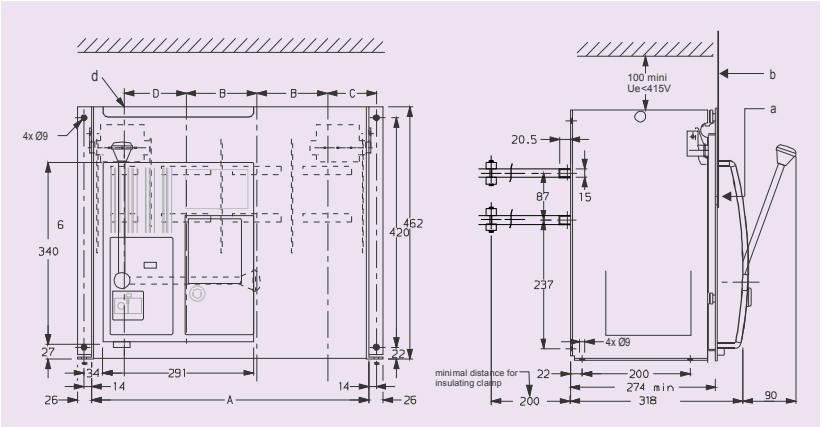
Installation

Fixed pattern							
Dimensions in mm	Height	462	462	462	462	462	
	Width 3pole	370	370	370	370	370	
	Width 4pole	458	458	458	458	458	
	Depth	273.5	273.5	273.5	273.5	273.5	
Available connection modes	Rear Horizontal	X	X	X	X	X	
	Rear Vertical						
	Front						
Net Weights in kg	3 pole	45	45	45	45	45	
	4 pole	54.7	54.7	54.7	54.7	54.7	
Draw-out pattern							
Dimensions in mm	Height	485	485	485	485	485	
	Width 3pole	374	374	374	374	374	
	Width 4pole	462	462	462	462	462	
	Depth	388	388	388	388	388	
Available connection modes	Rear Horizontal						
	Rear Vertical						
	Front	X	X	X	X	X	
Net Weights in kg	3 pole (ACB only)	49.8	49.8	49.8	49.8	49.8	
	4 pole (ACB only)	59.5	59.5	59.5	59.5	59.5	
	3 pole Cradle	18.6	18.6	18.6	18.6	18.6	
	4 pole Cradle	21.6	21.6	21.6	21.6	21.6	

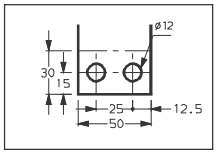
	SPN1600	SPN2000	SPN2500
	3,4	3,4	3,4
	1000	1000	1000
	8	8	8
	690	690	690
	B	B	B
	YES	YES	YES
	1600	2000	2500
	1500	1900	2350
	55	60	60
	35	35	35
	40	40	40
	50	55	55
	35	35	35
	40	40	40
	90	90	90
	50	55	55
	35	35	35
	120	130	130
	400	450	500
	1600	1250(3)	1250(3)
	10,000	10,000	10,000
	10,000	5,000	3,500
	1,500	1,500	1,500

	Possible	Possible	Possible
	Possible	Possible	Possible
	Possible	Possible	Possible

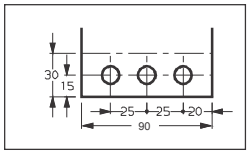
FIXED circuit breaker



Connectors 400-1600
Neutral 2000-2500



Connectors 2000 -2500

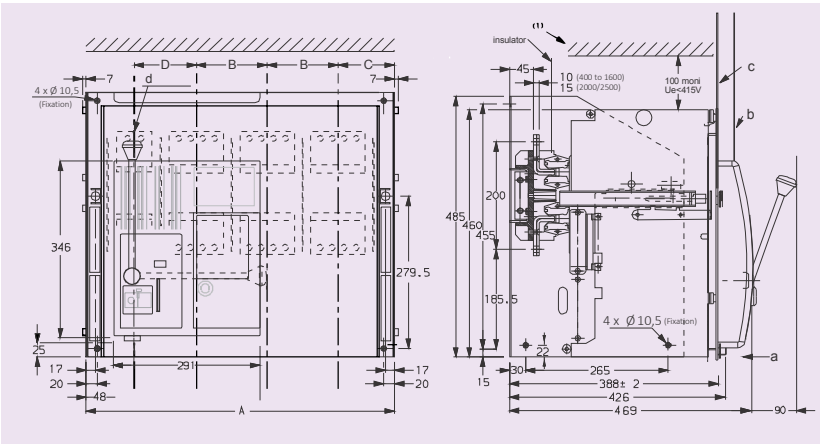


Circuit Breaker	Number of poles	A	B	C	D
SPN 400 to 1600	3	318	98	75	-
	4	406	98	70	98
SPN 2000 and 2500	3	412	130	90	-
	4	510	130	90	114

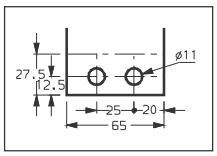
Dimensions are in mm

	462	462	462
	370	464	464
	458	562	562
	273.5	273.5	273.5
	X	X	X
	45.3	54.7	54.7
	54.9	64.8	64.8
	485	485	485
	374	468	468
	462	566	566
	388	388	388
	X	X	X
	50.1	59.3	59.3
	59.7	69.4	69.4
	18.6	24.7	24.7
	21.6	27.7	27.7

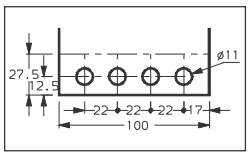
WITHDRAWABLE circuit breaker



Connectors 400 to 1600
Neutral 400 to 2500



Connectors 2000 to 2500



Circuit Breaker	Number of poles	A	B	C	D
SPN 400 to 1600	3	374	98	89	-
	4	462	98	84	98
SPN 2000 and 2500	3	468	130	104	-
	4	566	130	104	114

Dimensions are in mm

Notes

MTL Microprocessor Trip Units layout & Main menu

4 lines 20 characters LCD

MTL Microprocessor Trip Unit

Spectronic SPN Circuit Breaker is equipped with a digital microprocessor trip unit type MTL, that has a LCD screen providing an ammeter and a touchpad that allows a simple and accurate menu driven adjustment of the breaker parameters.
All functionality is menu driven accessed by using 4 setting and one power key thus allowing a fast and accurate setting of the device. These have the following functionality.

- On/Off Push button
- Press to access submenus or active the parameters
- Press to access and revolving menus
- Press to Back to Up Menu and Exit
- Enter — Press to validate changes

```
→Measured Data
 Setting Data
 Fault Records
       G1   0
```

Features

- Complete protections
  Overload (LT, LTD)
  Short circuit (ST, STD, I) with I²t cropping
  Ground Fault(GF, GFD) with I²t cropping

  LT: Long Time, LTD: Long Time with adjustable Delay
  ST: Short Time, STD: Short Time with adjustable Delay, I: Instantaneous
  GF: Ground Fault, GFD: Ground with adjustable Delay

```
 Setting ST:        G1
 Ist=7.5 xIr
 Tst=200 ms  (I2Toff)
       G1   0
```

- Zone selection (2 zones selectable) for better selectivity
- Alarms. Pre trip alarm and trip failure alarm
- Load shedding

```
 IRMS: R= 1120      A
       S= 1124      A
       T= 1118      A
       G1   0
```

- Measurements and monitoring.
  RMS value of each phase and neutral current
  Peak value of each phase and neutral current
  Frequency
  Thermal memory for each phases
  Operation counter (remote or manual mechanical on/off cycles)
  Trip counter
  Date and time
  Fault history(up to 64 records)

```
 Input Programming
 I1->None
 I2->None
       G1   0
```

- Programable inputs (2 digital inputs) which can be programed as
  Zone selection input
  Changeover command
  Remote trip command
  Close command

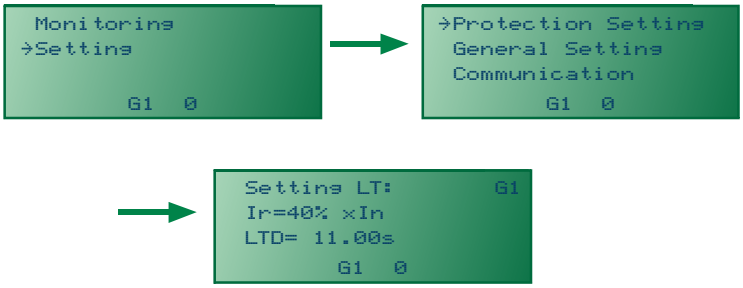
- Programable outputs(2 relay outputs) which can be programed as
  Pre trip alarm
  Trip indicator
  Trip failure alarm
  Load shedding
  Motor control
  Zone selection

```
 Com Setting:
 Parrity:OFF/adr:207
 Baudrate: 9600
       G1   0
```

- Communication
  Following functions are available through Modbus RS485 protocol in MTL trip unit.
  Reading all measured data
  Reading and writing of programming values
  Reading digital inputs
  Reading and writing relay outputs
  Trip command to ACB
  Close command to ACB
  Reading fault records
  Reading the situation of ACB

Overload Protection LT and LTD

Overload (LT) Protection
The MTL Trip unit on Spectronic SPN has an extremely accurate and easy to set overload or Long Time (LT) Protection . It is designed to pick up overloads that exceed 112% of the set value within two hours with a tolerance of 30%.

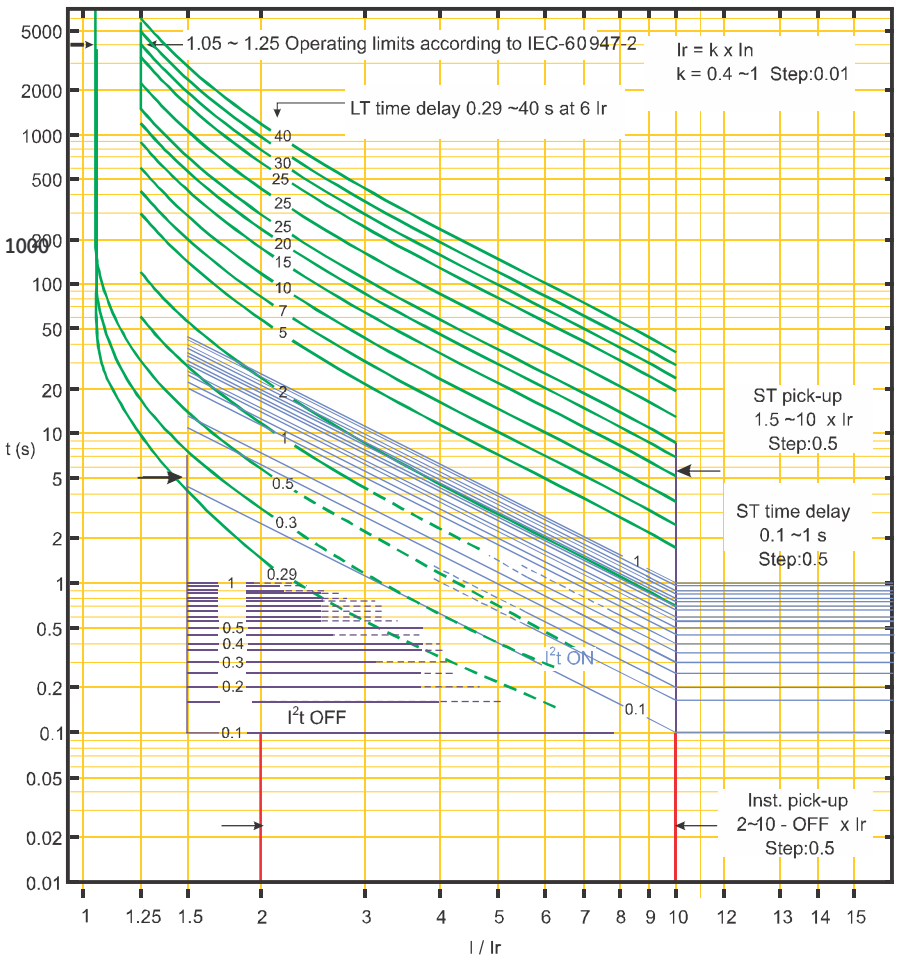


The device has setpoints distributed over a setting range of 0.4 to 1 times the chosen breaker rating (In) with 0.01 step

The LT protection type is designed to be used in association with down- and upstream circuit breakers and has a so called I^2t shape producing a curve form similar to standard industrial thermal magnetic protection devices.

In order to allow an accurate adjustment to the thermal properties of the protected equipment and to finely match the curve with those of Upstream & Downstream devices 16 time bands are available.

The table indicates the minimum delay time and maximum total interruption times for 3 frequently used reference points on the curve of each band. The graph portrays the LT behaviour for the time-current bands.

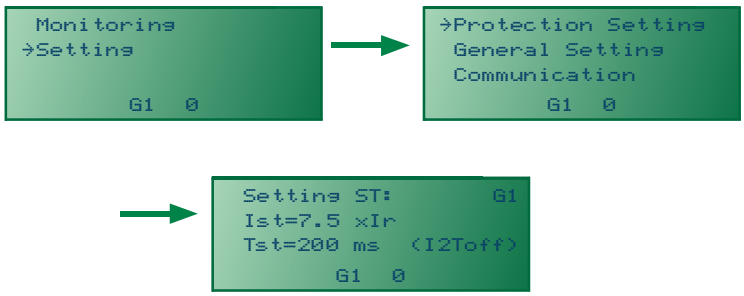


Current (multiple of Ir, Ir=kxIn)

Short-circuit Protection ST and STD and I

ST, STD, I

The MTL microprocessor Trip unit and breaker combination can be equipped with a number of different short-circuit protection devices each with their own distinctive properties and field of application.



The Timed Short-circuit Protection Device is designed to offer selectivity over a defined current range and offers a unique combination of multiple time bands and current settings.

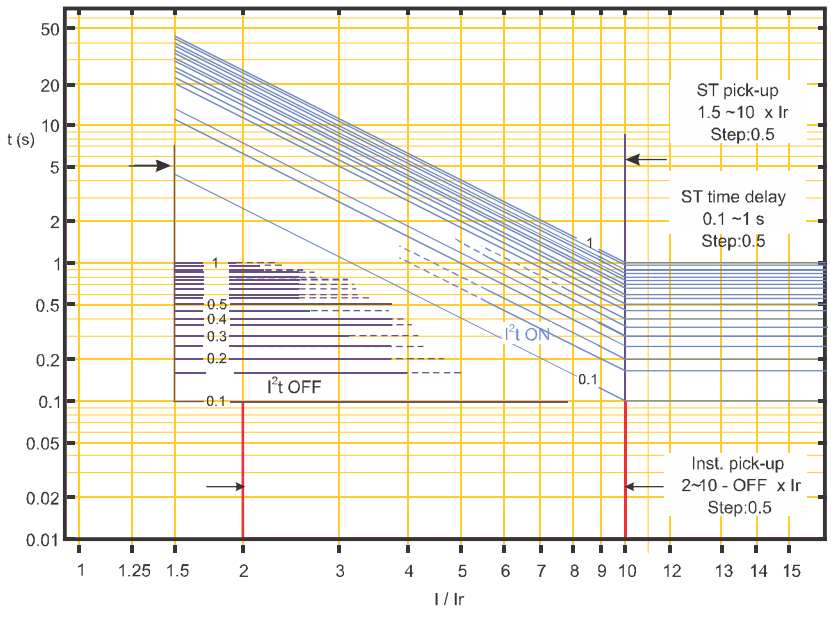
To allow selectivity with a wide range of different downstream devices whilst not unnecessarily sacrificing clearing time, 19 different time bands are available. The device has an adjustment range of 1.5 to 10 (+-10%) times the chosen Long Time current value (Ir) in steps of 0.5 (pick up setting).

The graph indicates 6 of the available 17 time bands across the full adjustment range.The table contains the minimum delay time and the maximum total interruption times for all time band settings.

Timed Short-circuit (ST) Protection I^2t bands (slope)

The ST device can also be set to a I^2t slope value. The available multiple I^2t slopes are normally used to achieve selectivity with downstream fuses or to improve selectivity with downstream circuit breakers.

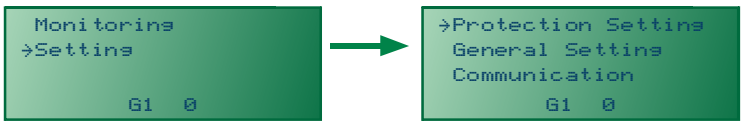
The device has an adjustment range of 1.5 to10 (+-10%) times the chosen Long Time current value (Ir) in steps of 0.5 (pick up setting) and 19 time bands.

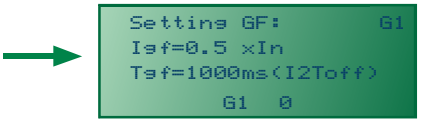


Current (multiple of Ir, Ir=kxIn)

Ground Fault Protections GF & GFD

To protect an installation or a part thereof against indirect contact, Protection Devices can be used to automatically disconnect the power supply when a fault to earth is detected.





A short-circuit device as an Spectronic SPN Circuit Breaker can be used to meet this requirement. However these short-circuit protection devices are normally set at values that are too high to detect normally occurring faults to Earth.

The optionally available Ground Fault protection feature is specifically designed to detect lower currents than a standard short-circuit Device and operate by residually summing the current in the Phases and Neutral. When a fault to Earth creates an unbalance in the system the resulting Fault Current is detected by the device that produces an alarm signal or trips the associated circuit breaker thus disconnecting the circuit.

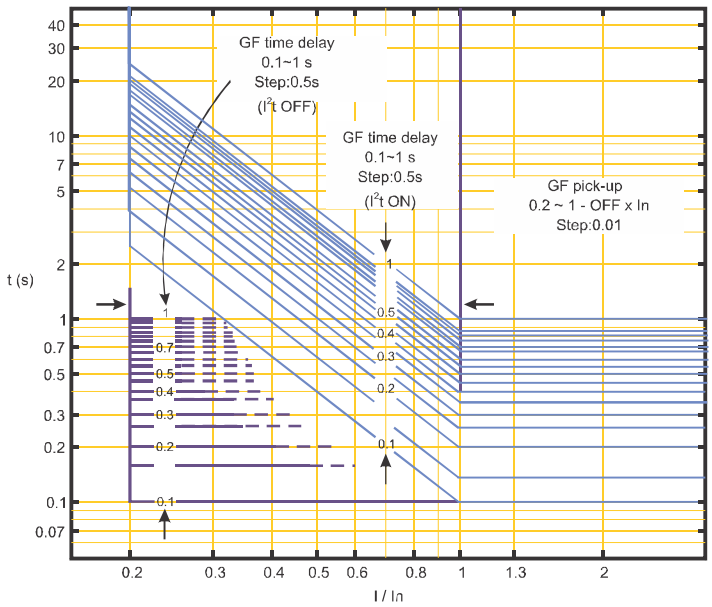
The MTL trip unit Ground fault device has an adjustment range of 0.2 to 1 (±15%) times them chosen breaker rating (In) and can be set in steps of 0.01 (pick up setting). To allow selectivity with other downstream protection devices there are 17 different time band settings available.

The graph indicates a number of the available 17 time bands across the full adjustment range.
The table contains the minimum delay time and the maximum total interruption times for all time band settings.

The Ground fault device must monitor the current in all phases and the Neutral. When a 3 pole device is used in a 4 wire (3phase + Neutral) system a 4th sensor must be placed in the Neutral. On use of a 4 pole Spectronic SPN breaker the sensor is already present in the Neutral pole.

Ground Fault Protection I^2t bands (slope)

The GF device can also be set to a slope value.
The available multiple I^2t slopes are normally used to achieve selectivity with downstream fuses or to improve selectivity with downstream circuit breakers.
The user has the possibility to choose a current adjustment of 0.2 to 1 (times the chosen the chosen breaker rating (In) in steps of 0.01 and one of 17 time bands.

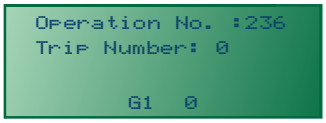


Current (multiple of Ir, Ir=kxIn)

Measurement Functions and Power Supplies

Ammeter

An Ammeter is supplied with each ACB with MTL Electronic Trip Unit.
The current in each of the three phases and the Neutral can be viewed.
The device has an accuracy of 2% when viewed at the nominal current of the breaker and an accuracy of 5% when viewed when the breaker is running at 50 - 85% of its full load.



Trip Reason Indicators (Fault History)
Trip Operations counter.

The Electronic Trip Unit keeps track of data indicating why the associated breaker has tripped and on how many occurrences have taken place. Accessible under the 'Fault record' menu the Trip Reason Indicator keeps track of a maximum of 64 events that have caused the Spectronic SPN breaker to trip. The device stores the phase's involved, the current value, the reason of the trip and the trip number (see counter). When an auxiliary voltage is connected the time and date of the event are also stored.

Reset history Function

When a fault has occurred the Trip Unit trips the associated breaker. It is then deemed normal installation practice to verify the reason of the fault before reconnecting power by resetting and switching the breaker on. The advanced options included in the MTL Trip Unit provide the user with the fault reason, magnitude and location, thus allowing the user to easily establish the required corrective actions.

Trip Unit reset history function should be set to erase recorded fault history.

Auxiliary Power Supply

The 24V DC auxiliary supply allows of the trip unit setup function when the standard supply is disconnected. At circuit loads >20% the standard power supply allows full uses of the setup option.

This device has internal battery and optionally can provide power by using a 24 V DC power supply.

MTS Protection trip unit

MTS Microprocessor Trip Unit

Spectronic SPN Circuit Breaker is equipped with a microprocessor trip unit type MTS, that has LEDs and adjustable selectors that allows a simple and accurate adjustment of the breaker parameters.

Reset and View buttons along LT,ST/I,GF LEDs make easy verification of what type of fault has tripped the ACB in case of any faults.

Power LED shows the healthy operation of trip unit and alarm LED is for warning/trip alarm.

Features

- Complete protections
  Overload (LT, LTD)
  Short circuit (ST, STD, I) with I²t cropping
  Ground Fault(GF, GFD) with I²t cropping

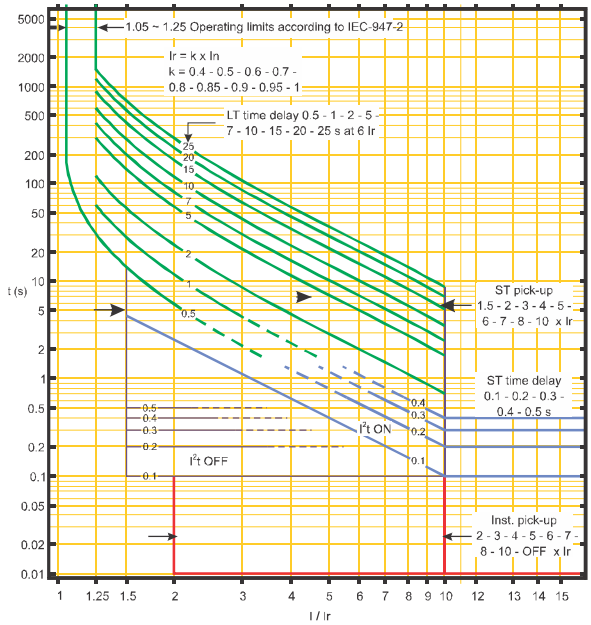
  LT: Long Time, LTD: Long Time with adjustable Delay
  ST: Short Time, STD: Short Time with adjustable Delay, I: Instantaneous
  GF: Ground Fault, GFD: Ground with adjustable Delay

- Alarms. Pre trip alarm and trip failure alarm

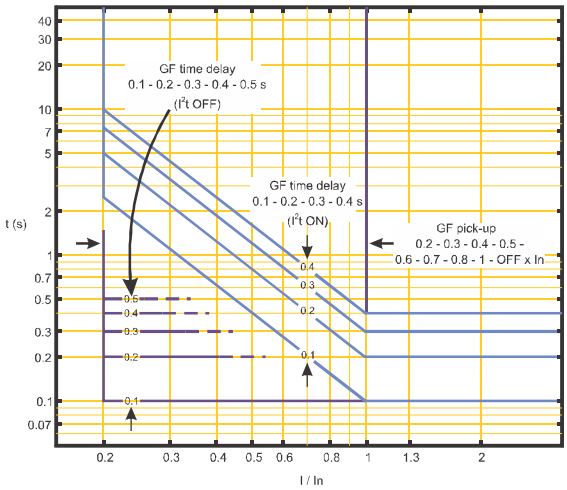
- Fault indicator LEDs
  LT LED: Lit when an over load fault has tripped the ACB
  ST/I LED: Lit when a short circuit fault has tripped the ACB
  GF LED: Lit when a ground fault has tripped the ACB

- Adjustable time delay for LT and ST and GF protections

Overload and short circuit trip curves



Ground faults curves



MTU Protection trip unit

MTU Microprocessor Trip Unit

Spectronic SPN Circuit Breaker is equipped with a microprocessor trip unit type MTS, that has adjustable selectors that allows a simple and accurate adjustment of the breaker parameters.

Features

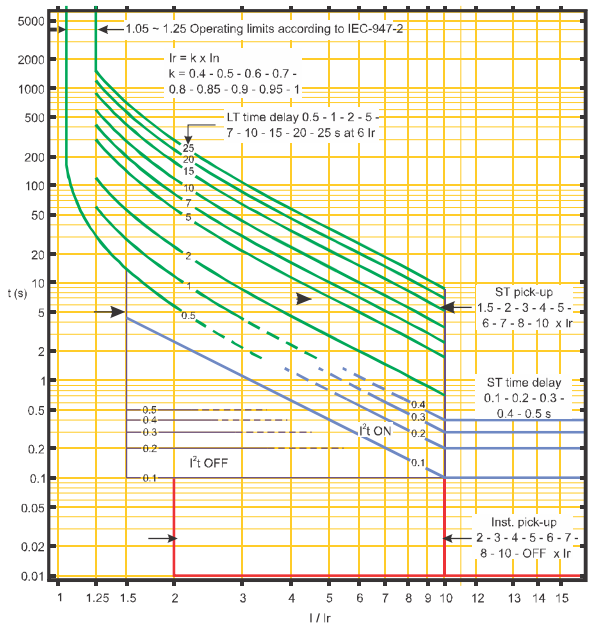
- Complete protections
  Overload (LT, LTD)
  Short circuit (ST, STD, I) with I²t cropping
  Ground Fault(GF, GFD) with I²t cropping

  LT: Long Time, LTD: Long Time with adjustable Delay
  ST: Short Time, STD: Short Time with adjustable Delay, I: Instantaneous
  GF: Ground Fault, GFD: Ground with adjustable Delay

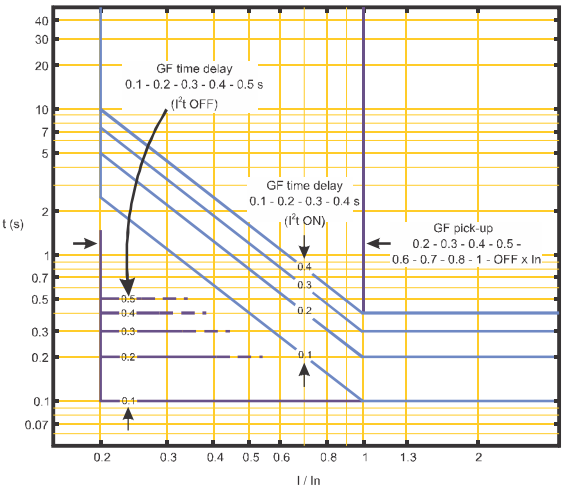
- Fault indicator LEDs
  LT LED: Lit when an over load fault has tripped the ACB
  ST/I LED: Lit when a short circuit fault has tripped the ACB
  GF LED: Lit when a ground fault has tripped the ACB

- Adjustable time delay for LT and ST and GF protections

Overload and short circuit trip curves



Ground faults curves



Trip Unit Functionality & available Long Time settings

Trip Unit functionality		MTL	MTS	MTU
Setting interface	LCD Screen allowing access to 4 distinct menu's	X	O	O
	Touch pad adjustments	X	O	O
	Manual setting by selectors	O	X	X
Long time or overload current protection	Ir=0.4 to 1 xIn current settings	X	X	X
	Setting of Ir with 0.01 step	X	O	O
	Adjustable time delay setting for fault trip	X	X	X
	Cooling function and Thermal memory	X	X	X
Short time short-circuit current protection	Setting range from 1.5 to 10 xIr (LT setting)	X	X	X
	I²t cropping on/off function	X	X	X
Instantaneous Short-circuit Current Protection	Setting range from 2 to 10 xIn	X	X	X
	Steps of 0.5	X	O	O
	Possibility to switch OFF	X	X	X
	Selective execution	X	X	X
Ground Fault Protection	Setting range from 0.2 to 1 xIn (Breaker rating)	X	X	X
	Steps of 0.01	X	O	O
	Possibility to switch OFF	X	X	X
	I²t cropping on/off function	X	X	X
Data Acquisition & Diagnostics	Trip reason indication	X	X	O
	Trip Info (Date/ time/ Phase)	X	O	O
	Trip Counter	X	O	O
	Event Logger (fault history)	X	O	O
	LT Thermal memory for each phases	X	X	X
Other	24V DC Auxiliary power supply	X	O	O
	Programable input/output	X	O	O

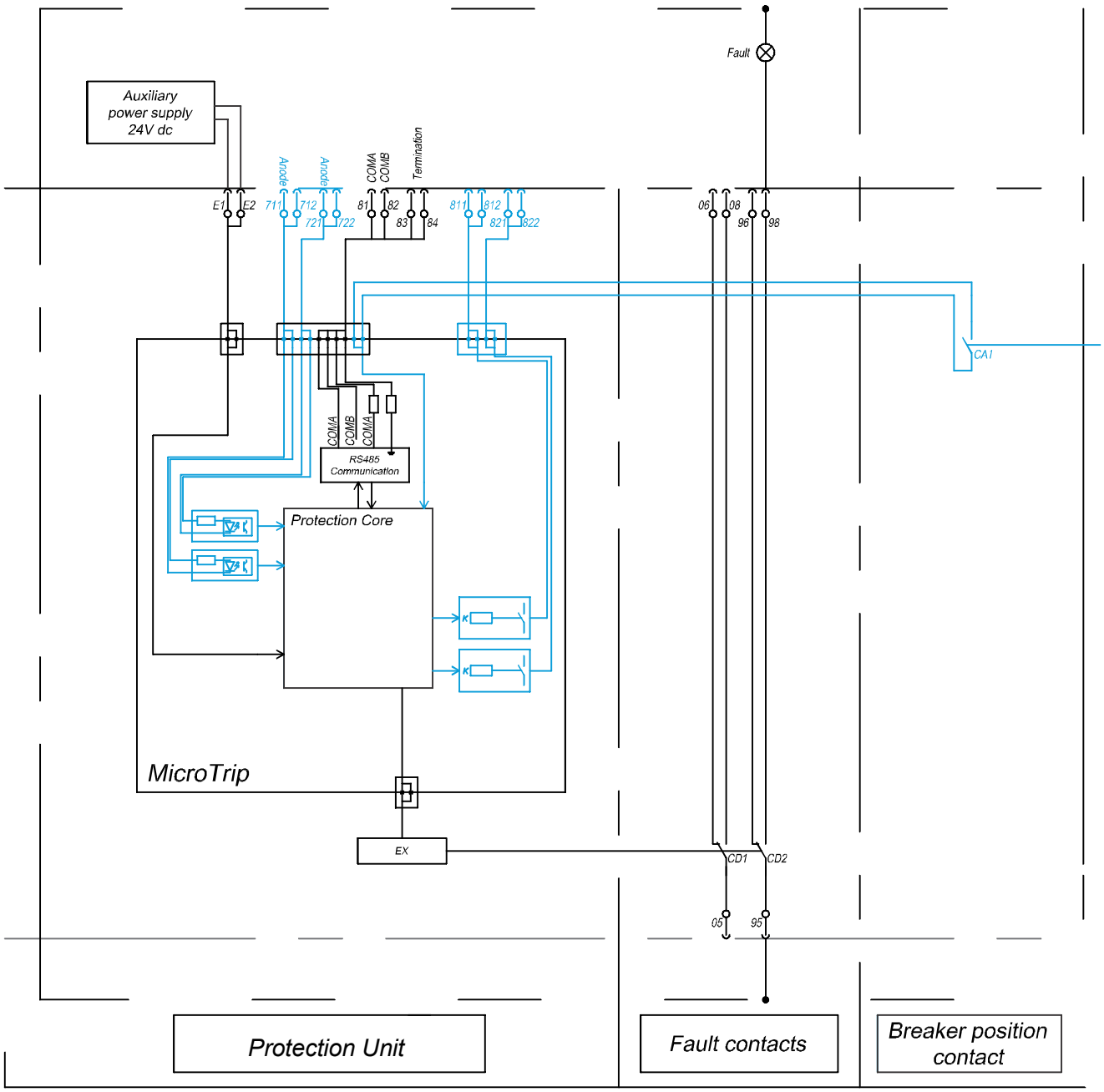
Key:
X = Present
O = No Present

Trip Unit LT settings

Breaker In (A)	400	630	800	100	1250
MT Setting x In	Available Setpoints (A)				
0,4	160	252	320	400	500
0,45	180	284	360	450	563
0,5	200	315	400	500	625
0,55	220	347	440	550	688
0,6	240	378	480	600	750
0,65	260	410	520	650	813
0,7	280	441	560	700	875
0,75	300	473	600	750	938
0,8	320	504	640	800	1000
0,75	300	473	600	750	938
0,8	320	504	640	800	1000
0,85	340	536	680	850	1063
0,9	360	567	720	900	1125
0,95	380	599	760	950	1188
1	400	630	800	1000	1250

Breaker In (A)	1600	2000	2500
MT Setting x In	Available Setpoints (A)		
0,4	640	800	1000
0,45	720	900	1125
0,5	800	1000	1250
0,55	880	1100	1375
0,6	960	1200	1500
0,65	1040	1300	1625
0,7	1120	1400	1750
0,75	1200	1500	1875
0,8	1280	1600	2000
0,75	1200	1500	1875
0,8	1280	1600	2000
0,85	1360	1700	2125
0,9	1440	1800	2250
0,95	1520	1900	2375
1	1600	2000	2500

MTL/MTS/MTU Trip Units diagram

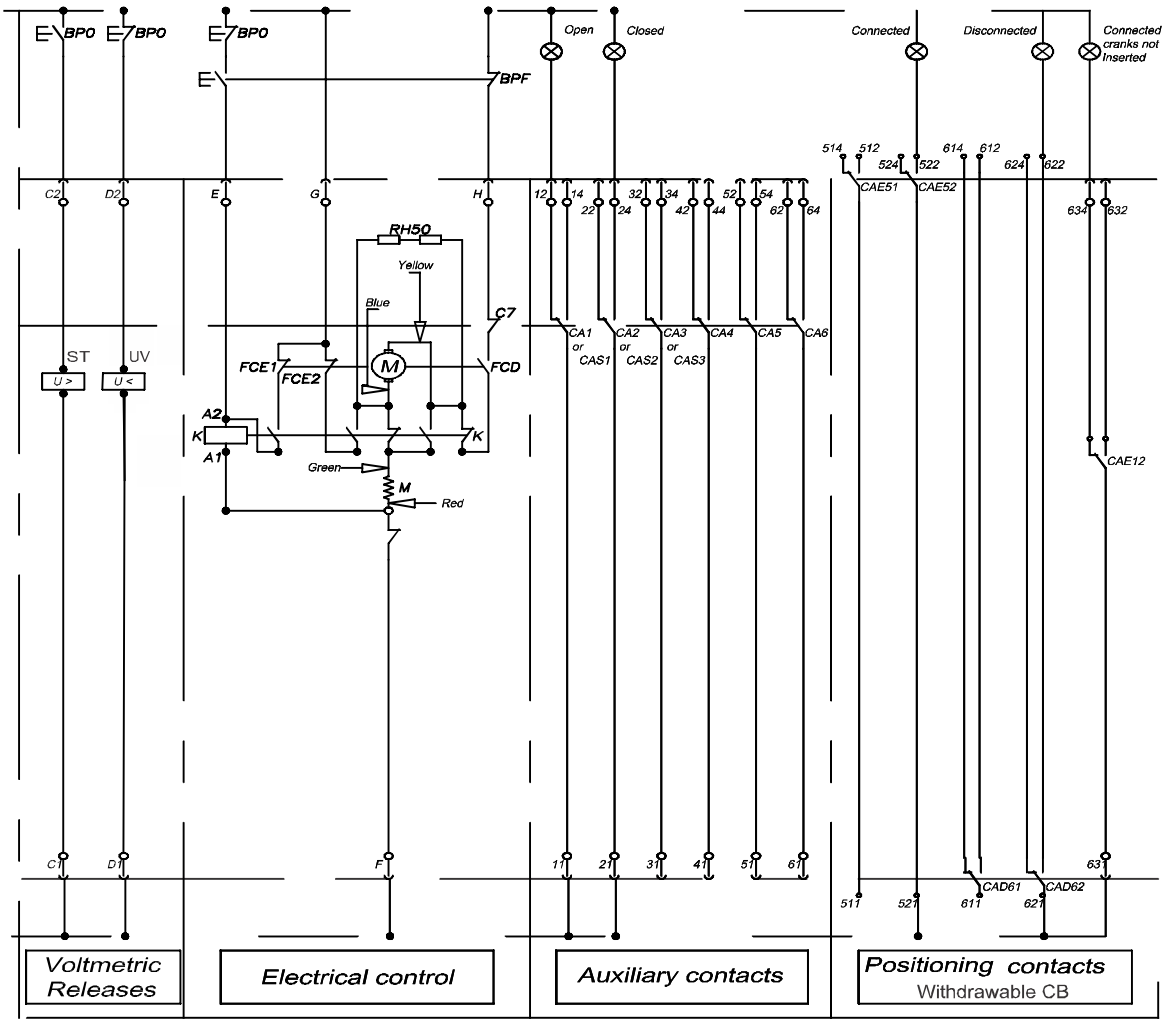


Only available for MTL

CAE 51 .52	: "plugged-in" position contact
CAD 61 .62	: "unplugged position contact
CAE 12	: plugged-in position contact, cranks not inserted
CD1 - CD 2	: overload and short-circuit fault contact
MV	: undervoltage release
MVR	: delayed undervoltage release
RA	: resistance for certain d.c. voltages
EA1 - EA - EB	: overcurrent release
K	:closing relay
FCE1. 2	: closing limit switch
FCD	: reset limit switch
M . m	: motor
RH50	: resistance for 380 V
C 21	: locking contact coupled with emergency control
CA - CAS	: auxiliary contacts
BPO	: opening contact
BPF	: closing contact

CA1 to CA6	Thermal current : 20A Interrupt rating: a-c. current power factor 0.3 - 48/127/220 V -12 - 380 v - 5 A d.c. L/R 0.01 s - 48 V - 3 A - 120 V - 0.7 A - 220 V - 0.45 A
CAS1 to CAS3	Thermal current : 17.5A Interrupt rating: d.c. L/R 0.01 s - 220 V - 0.45 A
CD1 - CD2 CAE12 CAE51 - CAE52 CAD61 - CAD62	Thermal current : 20A Interrupt rating: a-c. current power factor 0.3 - 48/127/220 V -12 - 380 v - 5 A

Spectronic SPN wiring diagram



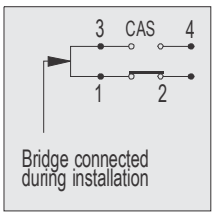
Electrical control

External wiring: wire cross section 2.5 mm^2(for 48V power supply, the wire length is max. 20 m)

For 48V: connection of electrical control on the circuit breaker and the C2 contact by 2.5 mm^2 wires.

Auxiliary contacts

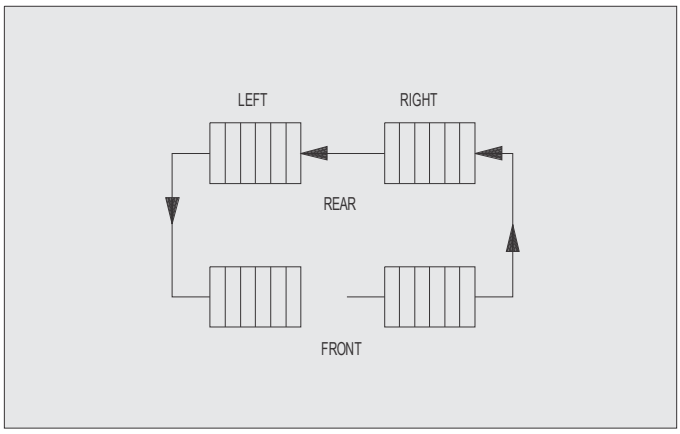
Six normal or three special auxiliary contacts.



End user connections

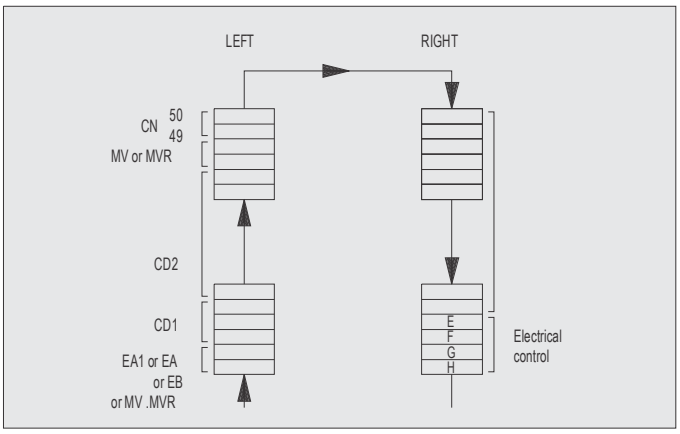
Fixed circuit breaker

Connection by terminals 6.3 x 0.8
24 terminals maximum
Letters in alphabetical order followed by increasing numbers



Withdrawable circuit breaker

Connections by terminals 6.3 x 0.8
For the electrical control of EA1, EA, EB, CD1, CD2, MVR, MV, use the allocated terminals. Other accessories: numbers are increasing clockwise(use reserved terminals if they are available).



Notes

Order Codes

Basic breakers executed in a fixed mounting pattern

- With Horizontal Rear Connection.
- Basic breaker MUST be equipped with a Trip Unit. (Please refer to page 23 for options)

Fixed type

Rating (A)	3 pole Cat. No.	3 pole Ref. No.	4 pole(1) Cat. No.	4 pole(1) Ref. No.
400	SPN400	775544	SPNF400	775514
630	SPN630	775543	SPNF630	775513
800	SPN800	776301	SPNF800	776302
1000	SPN1000	776313	SPNF1000	776314
1250	SPN1250	776323	SPNF1250	776324
1600	SPN1600	776333	SPNF1600	776334
2000	SPN2000	776343	SPNF2000	776344
2500	SPN2500	776353	SPNF2500	776354

Basic breakers: Drawout Breakers; Moving portion only

- With Front Connection cassette.
- Basic Breaker MUST be equipped with a Trip Unit. (Please refer to page 23 for options)

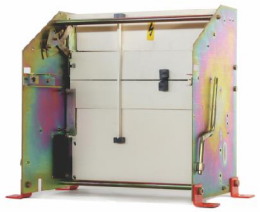
Draw-out type

Rating (A)	3 pole Cat. No.	3 pole Ref. No.	4 pole(1) Cat. No.	4 pole(1) Ref. No.
400	SPNW400	775574	SPNFW400	775504
630	SPNW630	775573	SPNFW630	775503
800	SPNW800	776303	SPNFW800	776304
1000	SPNW1000	776311	SPNFW1000	776312
1250	SPNW1250	776321	SPNFW1250	776322
1600	SPNW1600	776331	SPNFW1600	776332
2000	SPNW2000	776341	SPNFW2000	776342
2500	SPNW2500	776351	SPNFW2500	776352

(1) 4P3D

Cassettes for Draw-out Pattern; fixed portion only

Front connections

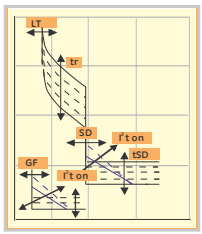
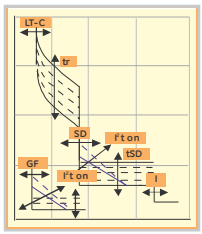
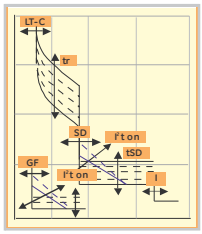


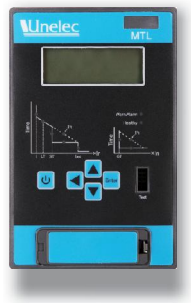
Rating (A)	Suited for use with Spectronic Draw-out types	3 pole Cat. No.	3 pole Ref. No.	4 pole Cat. No.	4 pole Ref. No.
Cassettes for Envelope 1					
400 - 1600A	Spectronic SPN	F1CRDL3	756100	F1CRDL4	756101
Cassettes for Envelope 2					
2000 - 2500A	Spectronic SPN	F2CRDL3	756102	F2CRDL4	756103

Remark: Each cassette is supplied with connection pads for vertical connections.

MT type Trip Units for Spectronic Circuit Breakers

Trip Units

	Basic functionality	Designation	Cat. No.	Ref. No.
MTL		MTL Trip Unit with: LT 0.4 -1 x In = Ir tr (16 type curves) SD I²T ON or OFF tSD (0.1 to 1 sec.) GF I²T ON or OFF tg (0.1 to 1 sec.) Fault history Fault type LED Ir step = 0.01	MTLAU	757767
MTS		MTS Trip Unit with: LT 0.4 -1 x In = Ir tr (9 type curves) SD I²T ON or OFF tSD (0.1 to 0.5 sec.) GF I²T ON or OFF tg (0.1 to 0.5 sec.) Fault type LED	MTSBU	757766
MTU		MTU Trip Unit with: LT 0.4 -1 x In = Ir tr (9 type curves) SD I²T ON or OFF tSD (0.1 to 0.5 sec.) GF I²T ON or OFF tg (0.1 to 0.5 sec.)	MTUBU	757765
EX actuator		For all MT Trip Unit	EXAMT	755379



CT coils

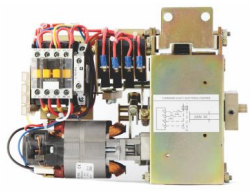
For ground fault protection with 3pole breaker in 4 wire networks
For use as spares

TN 11 Current transformers

Rating	Envelope 1 Cat. No.	Envelope 1 Ref. No.	Envelope 2 Cat. No.	Envelope 2 Ref. No.
400A	TN011400	756040		
630A	TN011630	756041		
800A	TN011800	756042		
1000A	TN111000	756043		
1250A	TN111250	756044		
1600A	TN111600	756045		
2000A			TN112000	756047
2500A			TN112500	756049

Internal Optional Accessories

Motor Operators(Electrical Control)



	Motor Operator DC		Motor Operator AC 50 Hz		Motor Operator AC 60 Hz	
	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
48V	EC010148	**756212**	EC010248	**756200**	EC010348	**756206**
110V	EC101110	**756213**	EC102110	**756201**	EC103110	**756201**
220V	EC101220	**756215**	EC102220	**756233**	EC103220	**756233**
380V			EC102380	**756205**	EC103380	**756211**
operates from 85% to 110% of nominal voltage						

Voltmetric Releases

	Undervoltage		Shunt	
48V AC/DC	UVT048AD	**770019**	STT048AD	**770011**
110V AC/DC	UVT110AD	**770023**	STT110AD	**770013**
125V AC/DC	UVT125AD	**770024**	STT125AD	**770014**
220V AC/DC	UVT220AD	**770026**	STT220AD	**770016**
Installation kit only	VRIKTF12	**770020**	VRIKTF12	**770020**
	operates under 60% of nominal voltage		operates from 75% to 110% of nominal voltage	

Auxiliary Contacts

1NO/1NC Auxiliary contacts	LAS1	**756062**
1NO Auxiliary contact	OAS1	**756061**
1NC Auxiliary contcat	CAS1	**756060**
1NO/1NC Bell Alarm contacts	BAS1	**752817**

Secondary terminals

	For fixed SPN		For draw-out SPN		
Block of 12 terminals	LFTF12	**756096**			max. 2 bolcks (max 10A/block)
Block of 6 terminals mov. part			SDMV06	**755907**	
Block of 6 terminals fixed part			SDFX06	**755908**	
Block of 6 complete terminals			SDFM06	**755909**	max. 4 bolcks

Position cradle Indication Contacts

1NO/1NC Connected position	CAE	**756095**	indicates the position of ACB in its cradle.
1NO/1NC Withdrawn position	CAD	**756094**	indicates the position of ACB in its cradle.
1NO/1NC Not Inserted pos.	CAE12	**752830**	indicates that closing of ACB can be actuated.

InterLocking Mechanisms

	Ronis		lock		padlocks	
Tripped position by	TRNS	**753203**	TLCK	**753204**	TPDL	**753205**
Withdrawn position by	WRNS	**753206**	WLCK	**753207**		

Source changeover mechanical Interlock

	For fixed SPN		For draw-out SPN			
Interlock for 2 circuit Breakers	FCHMI2	**756119**	WCHMI2	**756120**	TPDL	**753205**

Test position cord set

Test position cord set	TPCS	**756127**	for testing auxiliaries in disconnected position.

Internal Spare parts

Spark arrestors

	SPN400 up to SPN1600		SPN2000 and SPN2500		Number per pole	
	Cat. No.	Ref. No.	Cat. No.	Ref. No.	400/1600	2000/2500
Fixed spark arrestor	FSAF01	754107	FSAF02	754142	1	1
Movable spark arrestor	MSAF12	754102	MSAF12	754102	3	4

Arc barrier and Arc Chutes

	SPN400 up to SPN1600		SPN2000 and SPN2500		Number per pole	
Arc Barrier	ABF12	754005	ABF12	754005	2	2
Arc Chutes (for 500V)	ACF01	754143	ACF02	754133	1	1

Palmate contact and ground plug

	SPN400 up to SPN1600		SPN2000 and SPN2500	
Palmate contacts	PLMF1	754112	PLMC2	754113
Reinforced ground plug	RGP12	756132	RGP12	756132

Isolating Shutter

	SPN400 up to SPN1600		SPN2000 and SPN2500	
Isolating shutter for 3 poles	IS3P01	756110	IS3P02	756112
Isolating shutter for 4 poles	IS4P01	756111	IS4P02	756113

Other

	SPN400 up to SPN1600		SPN2000 and SPN2500	
Limit Switch FCE-FCD	LMS12	754139	LMS12	754139
Operation handle	OHF12	756114	OHF12	756114
Racking handles(1 pair)	CHF12	756118	CHF12	756118
Front aux. wiring terminal	UTR12	756116	UTR12	756116
Front facia for 3 poles	FF3P01	756121	FF3P02	756122
Front facia for 4 poles	FF4P01	756113	FF4P02	756124

Internal Accessories

Maximum amount of installable internal accessories

Motor Operator	CAE 12 position contcat	Undervoltage Release(1)	Shunt Release(1)	Auxiliary contacts NO+NC	Bell Alarm contacts	CAE position contact	CAD withdrawn position contact	Secondary terminal for Fixed ACB	Secondary terminal for drawout ACB	operation counter
1	1	1+1	1+1	6	2	2	2	2	4	1

(1) 1UV+1UV or 1ST+1ST or 1UV+1ST

Notes

Unelec
Industrial Equipment

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