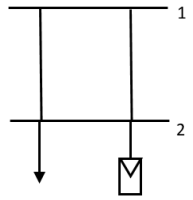
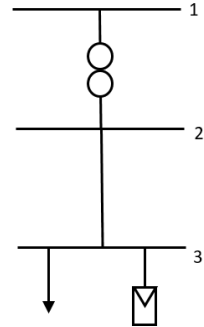
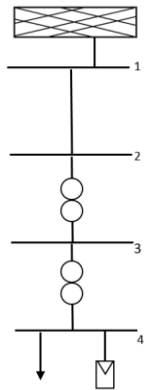


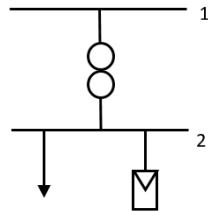
Load flow assessment test cases

The following test cases can be used to test the load flow assessment tool. The parameter for each network are given together with the expected results for each scenario.

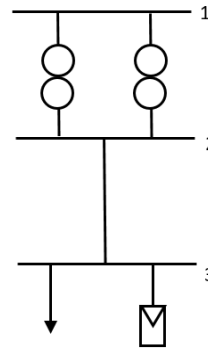
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				Nominal voltage			
				33 kV	33 kV	11 kV	415 V
Expected results:							
Voltage (p.u) and angle (°)							
Bus 1		$1 \angle 0^\circ$		$1 \angle 0^\circ$		$1 \angle 0^\circ$	
Bus 2		$1.004 \angle 0.06^\circ$		$1 \angle 0^\circ$		$1 \angle 0^\circ$	
Bus 3				$0.94 \angle -0.92^\circ$		$0.999 \angle 0.039^\circ$	
Bus 4						$0.9203 \angle 6.16^\circ$	
Power flows (MVA)							
Branch A-1		-0.025		0.03		0.29	
Branch A-2		-0.025					
Branch B-1				0.03		0.29	
Branch B-2							
Branch C-1						0.27	
Branch C-2							

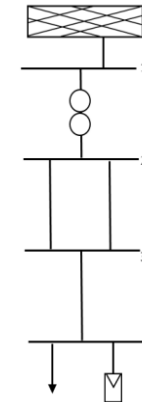
Test scenario:



Parameter	A-1	
Branch details	315 kVA 11,22/0,422 kV 3%	
Length	-	
Current limit	HV: 15.66 A LV: 360 A	
Bus data		
	Bus 1	Bus 2
Loads	-	30 kVA (PF =1)
SSEG	-	80 kVA (PF =1)
Nominal voltage	11 kV	422 V



Parameter	A-1	A-2	B-1
Branch details	200 MVA 11 kV /0.4 kV 5%	200 MVA 11 kV /0.4 kV 5%	0.32 + 0.08j Ω/km
Length	-	-	1 km
Current limit	HV: 15.66 A LV: 360 A	HV: 15.66 A LV: 360 A	400 A
Bus data			
	Bus 1	Bus 2	Bus 3
Loads	-	-	30 kVA (PF =1)
SSEG	-	-	-
Nominal voltage	11k V	400 V	400 V



Parameter	A-1	B-1	B-2	C-1
Branch details	100 kVA 11/0.415 kV 4.5 %	95 Cu 0.193 Ω/km	95 Cu 0.193 Ω/km	95 Cu 0.193 Ω/km
Length	-	400 m	400 m	200 m
Current limit	HV: 15.66 A LV: 360 A	337 A	337 A	337 A
Bus data				
	Bus 1	Bus 2	Bus 3	Bus 4
Loads	-	-	10 kVA (PF =0.95)	250 kVA (PF =1)
SSEG	-	-	-	100kVA (PF =1)

Expected results:			
Voltage (p.u) and angle (°)			
Bus 1	$1 \angle 0^\circ$	$1 \angle 0^\circ$	$1 \angle 0^\circ$
Bus 2	$1.005 \angle 0^\circ$	$1 \angle 0^\circ$	$0.914 \angle 0.09^\circ$
Bus 3		$0.94 \angle -0.92^\circ$	$0.871 \angle 0.14^\circ$
Bus 4		0	$0.83 \angle 0.14^\circ$
Power flows (MVA)			
Branch A-1	-0.05	0.02	0.165
Branch A-2		0.02	
Branch B-1		0.03	0.05
Branch B-2			0.05
Branch C-1			0.15
Branch C-2			