SIEMENS

Клиент: ЧЕЗ
Проект: ЧЕЗ
Номер:

Спецификация на КРУ средно напрежение тип 8DJH

Поз. No.	К-во	Описание	No. на типов панел
3.3	1	**Панел вход/изход (310 mm)** Широчина на панела: 310 mm Номинален ток на извода: 630 A Оборудван със следните елементи:	**=JZ05**
3.3.7		**Трипозиционен разединител** Комутационно устройство за разединяване и заземяване на извода (заземяваща функция със възможност за изключване под товар, и функция заземяване с пружинно мигновено действие) С ръчно задвижване за функции ЗАТВАРЯНЕ И РАЗЕДИНЯВАНЕ Режим на управление на заземителния нож с пружинно мигновено действие: с ръчно задвижване Конструкция на задвижващия механизъм: механизъм с пружинно задвижване Функции (за ръчно и моторно задвижване): пружина ВКЛЮЧЕНА-ИЗКЛЮЧЕНА Със заключващо устройство: за катинар	
3.3.8		**Присъединяване на панела** Предвиден е кабелен отсек за отвеждане извън панела на следното: 1 кабел надолу Свързване към проходните изолатори (външна конусна система: Интерфейс тип C (EN 50181) с болтова връзка M16 (630 A) Капак на кабелния отсек: стандартен Налична дълбочина за кабелни глави: 300 mm Дълбочина на панела 775 mm Закрепване на кабелите: С 1 кабелна скоба, без C-rail Предварително монтирани кабелни скоби, D=36-52 mm При стандартно изпълнение, кабелният отсек е предвиден за свързване на панела. В зависимост от кабелите или кабелните глави, е възможно да се налага ретрофит. Предвиден е кабелен отсек за отвеждане извън панела на следното: 1 кабел	
3.3.9		**Капацитивна система за следене на напрежението** Устройство: LRM система с интегриран индикатор, тип VOIS+ за избраното номинално напрежение.	
3.3.4		**Вентилен отвод/ Ограничител на напрежението** Кабелното отделение е подготвено за монтаж на вентилни отводи. В зависимост от типа на вентилния отвод може да се наложи ретрофит.	

3.3.5 **Индикатор за късо и земно съединение**
Производител: Horstmann

SIEMENS

Клиент: ЧЕЗ
Проект: ЧЕЗ
Номер:

Спецификация на КРУ
средно напрежение тип
8DJH

Аксесоари

Поз. No.	К-во	Описание	Типов панел No. =JZ00
	1	Доставка без заводска приемка	
	1	Протокол от рутинни изпитания 8DJH (DE/EN)	
	1	Куплунги за шината за свързване между разширенията на шинната система на два единични панела или блокове, комплект, включващ: 3 контактни елемента, 3 силиконови изолатори, 3 заредени пружини за заземяване, 2 центриращи болта, други	

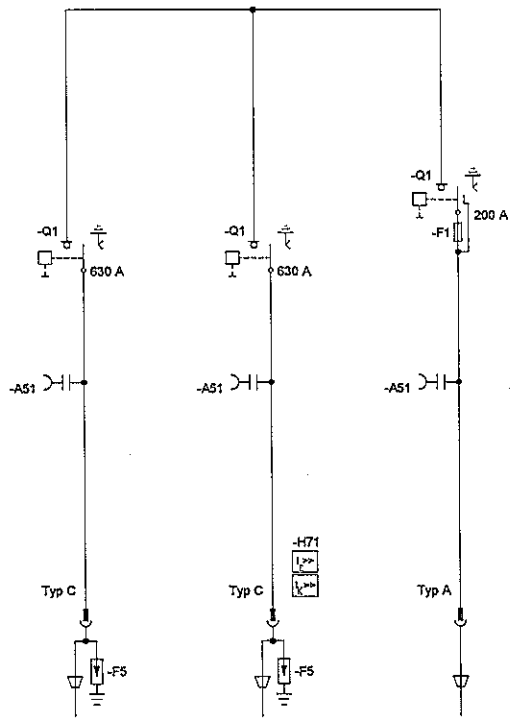
5. Документация (Приложение)

4.1 Еднолинейна схема

4.2 Чертеж с разположението на панелите

4.3 Конструктивни данни

=J01	=J02	=J03
+J01	+J02	+J03
=JZ01	=JZ02	=JZ03



System/rated frequency	Operating voltage	Rated voltage	Rated short-time withst. curr.	Rated normal current
3~50 Hz	20.0 kV	24.0 kV	16.0 kA (1 s)	630 A

				Date	23.07.2013	CEZ RRT 20kV	SIEMENS	8DJH 8DJH 8DJH-82127	T13017	=J00 +J00	
				Created by	Kitanov						B01
				Checked by							Sh.No 01-1
Issue	Revision	Date	Name	Standard		Orig. / Repl. f. / Repl. by		Single Line Diagram			

FRONT VIEW

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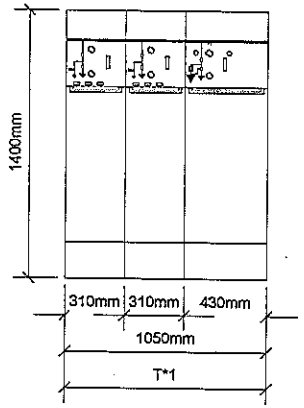
+J01 +J02 +J03
=JZ01 =JZ02 =JZ03



LOAD DATA AND MINIMUM DISTANCES

1.) MAX. PERMANENT LOADS
Fv VERTICAL SINGLE LOAD
PANEL WIDTH 310 mm 1.9 kN
PANEL WIDTH 430 mm 3.0 kN
PANEL WIDTH 500 mm 4.0 kN
PANEL WIDTH 840 mm 3.5 kN

2.) NON PERMANENT LOADS
pe MAX LIVE LOAD 6 kN/m²

3.) MINIMUM DISTANCES
WALL CLEARANCE REAR ≥ 15 mm
WALL CLEARANCE LEFT / RIGHT ≥ 50 mm
WITH EXTENSION ≥ 200 mm

4.) HEIGHT OF CEILING
SWITCHGEAR HEIGHT 1400 mm * ≥ 2000 mm
SWITCHGEAR HEIGHT 2000 mm / 2300 mm ≥ 2400 mm

5.) MINIMUM DOOR OPENING
SWITCHGEAR HEIGHT ≤ 1700 mm * 1000 mm x 2000 mm
SWITCHGEAR HEIGHT 2000 mm 1000 mm x 2200 mm
SWITCHGEAR HEIGHT 2300 mm. 1200 mm x 2500 mm
* WITHOUT CABLE DUCT OR LV-CABINET

THE LOCATION AND DETAIL DIAGRAMS DO HAVE SYMBOLIC CHARACTER AND DO NOT SHOW THE ACTUAL SCOPE OF SUPPLY.

System/rated frequency	Operating voltage	Rated voltage	Rated short-time withst. curr.	Rated normal current
3~50 Hz	20.0 kV	24.0 kV	16.0 kA (1 s)	630 A

				Date	23.07.2013	CEZ	
				Created by	Kitanov	RRT 20kV	
				Checked by		Orig. / Repl. f. / Repl. by	
Issue	Revision	Date	Name	Standard			

SIEMENS

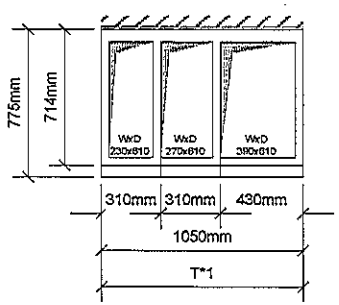
8DJH
8DJH
8DJH-82127
Location diagram

T13017

=J00
+J00
B01
Sh.No 01-
1

PLAN VIEW

=J01	=J02	=J03
+J01	+J02	+J03
=JZ01	=JZ02	=JZ03



LOAD DATA AND MINIMUM DISTANCES

1.) MAX. PERMANENT LOADS
Fv VERTICAL SINGLE LOAD

PANEL WIDTH 310 mm	1.0 kN
PANEL WIDTH 430 mm	3.0 kN
PANEL WIDTH 600 mm	4.0 kN
PANEL WIDTH 640 mm	3.5 kN

2.) NON PERMANENT LOADS

pa MAX LIVE LOAD	6 kN/m²

3.) MINIMUM DISTANCES

WALL CLEARANCE REAR	≥ 10 mm
WALL CLEARANCE LEFT / RIGHT	≥ 50 mm
WITH EXTENSION	≥ 200 mm

4.) HEIGHT OF CEILING

SWITCHGEAR HEIGHT 1400 mm *	≥ 2000 mm
SWITCHGEAR HEIGHT 2000 mm / 2300 mm	≥ 2400 mm

5.) MINIMUM DOOR OPENING

SWITCHGEAR HEIGHT ≤ 1700 mm *	1000 mm x 2000 mm
SWITCHGEAR HEIGHT 2000 mm	1000 mm x 2200 mm
SWITCHGEAR HEIGHT 2300 mm	1200 mm x 2500 mm

* WITHOUT CABLE DUCT OR LV-CABINET

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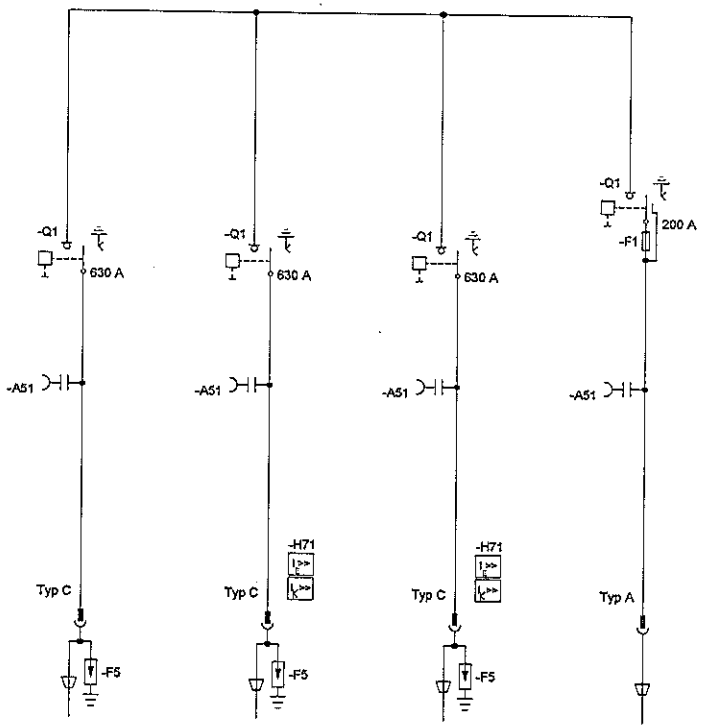
System/rated frequency	Operating voltage	Rated voltage	Rated short-time withst. curr.	Rated normal current
3~50 Hz	20.0 kV	24.0 kV	16.0 kA (1 s)	630 A

				Date	23.07.2013	CEZ	SIEMENS	8DJH	T13017	=J00	
				Created by	Kitanov			8DJH		+J00	B01
				Checked by		RRT 20kV		8DJH-82127			Sh.No 01-
Issue	Revision	Date	Name	Standard		Orig. / Repl. f. / Repl. by		Constructional Data			1

=J01	=J02	=J03	=J04
+J01	+J02	+J03	+J04
=JZ01	=JZ02	=JZ02	=JZ03



System/rated frequency	Operating voltage	Rated voltage	Rated short-time withst. curr.	Rated normal current
3~50 Hz	20.0 kV	24.0 kV	16.0 kA (1 s)	630 A

				Date	23.07.2013	CEZ	
				Created by	Kitanov	RRRT 20kV	
				Checked by		Orig. / Repl. f. / Repl. by	
Issue	Revision	Date	Name	Standard			

SIEMENS

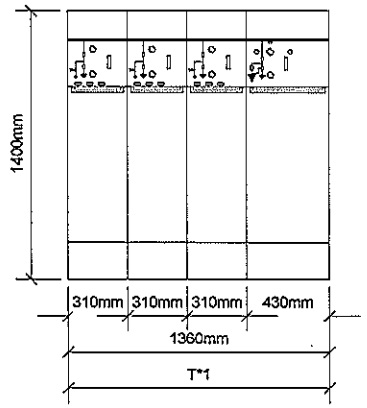
8DJH
8DJH
8DJH-82135
Single Line Diagram

T13017

=J00
+J00
B01
Sh.No 01-
1

FRONT VIEW

=J01	=J02	=J03	=J04
+J01	+J02	+J03	+J04
=JZ01	=JZ02	=JZ02	=JZ03



LOAD DATA AND MINIMUM DISTANCES

1.) MAX. PERMANENT LOADS
Fv VERTICAL SINGLE LOAD

PANEL WIDTH 310 mm	1.8 kN
PANEL WIDTH 430 mm	3.0 kN
PANEL WIDTH 500 mm	4.0 kN
PANEL WIDTH 840 mm	3.5 kN

2.) NON PERMANENT LOADS

pe MAX LIVE LOAD	0 kN/m²

3.) MINIMUM DISTANCES

WALL CLEARANCE REAR	≥ 15 mm
WALL CLEARANCE LEFT / RIGHT	≥ 50 mm
WITH EXTENSION	≥ 200 mm

4.) HEIGHT OF CEILING

SWITCHGEAR HEIGHT 1400 mm *	≥ 2000 mm
SWITCHGEAR HEIGHT 2000 mm / 2300 mm	≥ 2400 mm

5.) MINIMUM DOOR OPENING

SWITCHGEAR HEIGHT ≤ 1700 mm *	1000 mm x 2000 mm
SWITCHGEAR HEIGHT 2000 mm	1000 mm x 2200 mm
SWITCHGEAR HEIGHT 2300 mm	1200 mm x 2500 mm

* WITHOUT CABLE DUCT OR LV-CABINET

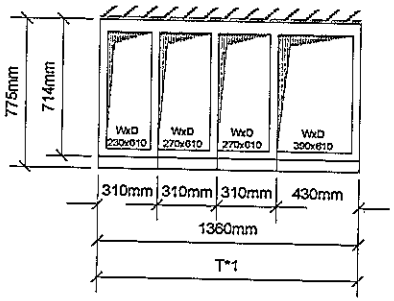
THE LOCATION AND DETAIL DIAGRAMS DO HAVE SYMBOLIC CHARACTER AND DO NOT SHOW THE ACTUAL SCOPE OF SUPPLY.

System/rated frequency	Operating voltage	Rated voltage	Rated short-time withst. curr.	Rated normal current
3~50 Hz	20.0 kV	24.0 kV	16.0 kA (1 s)	630 A

				Date	23.07.2013	CEZ	SIEMENS	8DJH	T13017	=J00	
				Created by	Ktanov			8DJH		+J00	B01
				Checked by		RRRT 20kV		8DJH-82135			Sh.No 01-
Issue	Revision	Date	Name	Standard		Orig. / Repl. f. / Repl. by		Location diagram			1

PLAN VIEW

=J01	=J02	=J03	=J04
+J01	+J02	+J03	+J04
=JZ01	=JZ02	=JZ02	=JZ03



LOAD DATA AND MINIMUM DISTANCES

1.) MAX. PERMANENT LOADS
Fv VERTICAL SINGLE LOAD
- PANEL WIDTH 310 mm: 1.0 kN
- PANEL WIDTH 430 mm: 3.0 kN
- PANEL WIDTH 500 mm: 4.0 kN
- PANEL WIDTH 640 mm: 3.5 kN

2.) NON PERMANENT LOADS
pe MAX LIVE LOAD: 0 kN/m²

3.) MINIMUM DISTANCES
- WALL CLEARANCE REAR: ≥ 15 mm
- WALL CLEARANCE LEFT / RIGHT: ≥ 50 mm
- WITH EXTENSION: ≥ 200 mm

4.) HEIGHT OF CEILING
- SWITCHGEAR HEIGHT 1400 mm *: ≥ 2000 mm
- SWITCHGEAR HEIGHT 2000 mm / 2300 mm: ≥ 2400 mm

5.) MINIMUM DOOR OPENING
- SWITCHGEAR HEIGHT ≤ 1700 mm *: 1000 mm x 2000 mm
- SWITCHGEAR HEIGHT 2000 mm: 1000 mm x 2200 mm
- SWITCHGEAR HEIGHT 2300 mm: 1200 mm x 2500 mm

* WITHOUT CABLE DUCT OR LV-CABINET

System/rated frequency	Operating voltage	Rated voltage	Rated short-time withst. curr.	Rated normal current
3~50 Hz	20.0 kV	24.0 kV	16.0 kA (1 s)	630 A

				Date	23.07.2013	CEZ	
				Created by	Ktanov	RRRT 20kV	
				Checked by		Orig. / Repl. f. / Repl. by	
Issue	Revision	Date	Name	Standard			

SIEMENS

8DJH
8DJH
8DJH-82135

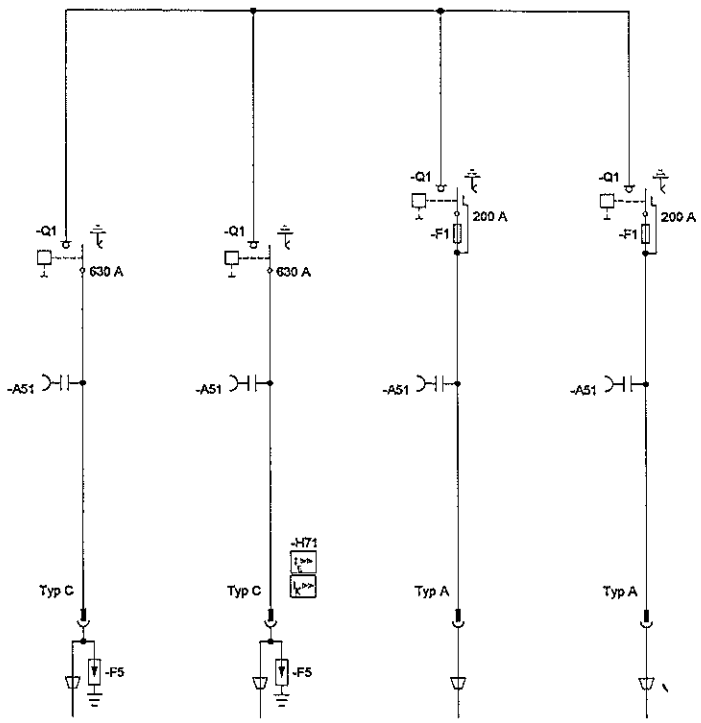
Constructional Data

T13017

+J00
+J00

B01
Sh.No 01-
1

=J01	=J02	=J03	=J04
+J01	+J02	+J03	+J04
=JZ01	=JZ02	=JZ03	=JZ03

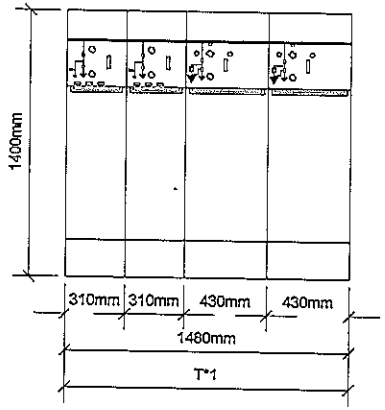


System/rated frequency	Operating voltage	Rated voltage	Rated short-time withst. curr.	Rated normal current
3~50 Hz	20.0 kV	24.0 kV	16.0 kA (1 s)	630 A

				Date	23.07.2013	CEZ	SIEMENS	8DJH	T13017		=J00	
				Created by	Klisnov			8DJH			+J00	B01
				Checked by		RRTT 20kV		8DJH-82138				Sh.No 01-
Issue	Revision	Date	Name	Standard		Orig. / Repl. f. / Repl. by		Single Line Diagram				1

FRONT VIEW

=J01	=J02	=J03	=J04
+J01	+J02	+J03	+J04
=JZ01	=JZ02	=JZ03	=JZ03



LOAD DATA AND MINIMUM DISTANCES

1.) MAX. PERMANENT LOADS
Fv VERTICAL SINGLE LOAD

PANEL WIDTH 310 mm	1.8 kN
PANEL WIDTH 430 mm	3.0 kN
PANEL WIDTH 500 mm	4.0 kN
PANEL WIDTH 640 mm	3.5 kN

2.) NON PERMANENT LOADS

ps MAX LIVE LOAD	6 kN/m²

3.) MINIMUM DISTANCES

WALL CLEARANCE REAR	≥ 15 mm
WALL CLEARANCE LEFT / RIGHT	≥ 50 mm
WITH EXTENSION	≥ 200 mm

4.) HEIGHT OF CEILING

SWITCHGEAR HEIGHT 1400 mm *	≥ 2000 mm
SWITCHGEAR HEIGHT 2000 mm / 2300 mm	≥ 2400 mm

5.) MINIMUM DOOR OPENING

SWITCHGEAR HEIGHT ≤ 1700 mm *	1000 mm x 2000 mm
SWITCHGEAR HEIGHT 2000 mm	1000 mm x 2200 mm
SWITCHGEAR HEIGHT 2300 mm	1200 mm x 2500 mm

* WITHOUT CABLE DUCT OR LV-CABINET

THE LOCATION AND DETAIL DIAGRAMS DO HAVE SYMBOLIC CHARACTER AND DO NOT SHOW THE ACTUAL SCOPE OF SUPPLY.

System/rated frequency	Operating voltage	Rated voltage	Rated short-time withst. curr.	Rated normal current
3~50 Hz	20.0 kV	24.0 kV	16.0 kA (1 s)	630 A

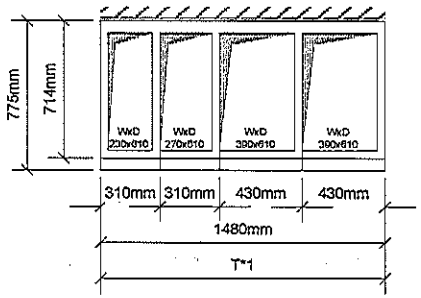
				Date	23.07.2013	CEZ	SIEMENS	8DJH 8DJH 8DJH-82138
				Created by	IGlanov	RRTT 20kV		
				Checked by				
Issue	Revision	Date	Name	Standard		Orig. / Repl. f. / Repl. by		Location diagram

T13017

=J00
+J00
B01
Sh.No 01-
1

PLAN VIEW

=J01	=J02	=J03	=J04
+J01	+J02	+J03	+J04
=JZ01	=JZ02	=JZ03	=JZ03



LOAD DATA AND MINIMUM DISTANCES

1.) MAX. PERMANENT LOADS
Fv VERTICAL SINGLE LOAD
- PANEL WIDTH 310 mm: 1.8 kN
- PANEL WIDTH 430 mm: 3.0 kN
- PANEL WIDTH 500 mm: 4.0 kN
- PANEL WIDTH 640 mm: 3.5 kN

2.) NON PERMANENT LOADS
pa MAX LIVE LOAD: 6 kN/m²

3.) MINIMUM DISTANCES
- WALL CLEARANCE REAR: ≥ 15 mm
- WALL CLEARANCE LEFT / RIGHT: ≥ 50 mm
- WITH EXTENSION: ≥ 200 mm

4.) HEIGHT OF CEILING
- SWITCHGEAR HEIGHT 1400 mm *: ≥ 2000 mm
- SWITCHGEAR HEIGHT 2000 mm / 2300 mm: ≥ 2400 mm

5.) MINIMUM DOOR OPENING
- SWITCHGEAR HEIGHT ≤ 1700 mm *: 1000 mm x 2000 mm
- SWITCHGEAR HEIGHT 2000 mm: 1000 mm x 2200 mm
- SWITCHGEAR HEIGHT 2300 mm: 1200 mm x 2500 mm

* WITHOUT CABLE DUCT OR LV-CABINET

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System/rated frequency	Operating voltage	Rated voltage	Rated short-time withst. curr.	Rated normal current
3~50 Hz	20.0 kV	24.0 kV	16.0 kA (1 s)	630 A

			Date	23.07.2013	
			Created by	Ktanov	
			Checked by		
Issue	Revision	Date	Name	Standard	

CEZ
RRTT 20kV
Orig. / Repl. f. / Repl. by

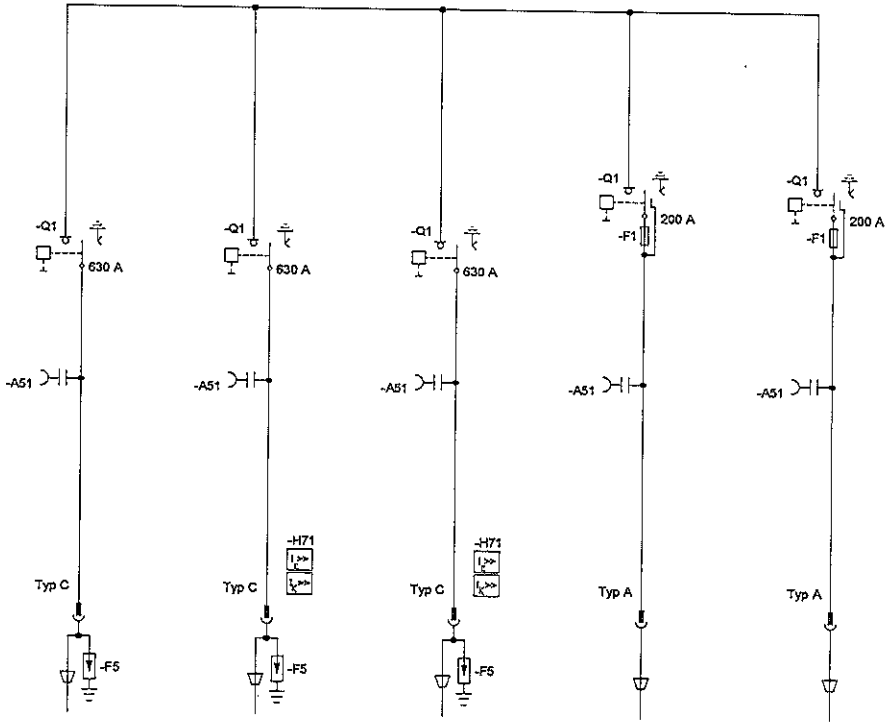
SIEMENS

8DJH
8DJH
8DJH-82138
Constructional Data

T13017

=J00	
+J00	B01
	Sh.No 01-
	1

=J01 +J01 =JZ01	=J02 +J02 =JZ02	=J03 +J03 =JZ02	=J04 +J04 =JZ03	=J05 +J05 =JZ04

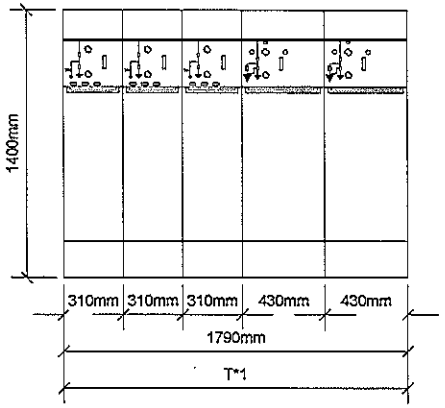


System/rated frequency	Operating voltage	Rated voltage	Rated short-time withst. curr.	Rated normal current
3~50 Hz	20.0 kV	24.0 kV	16.0 kA (1 s)	630 A

				Date	23.07.2013	CEZ RRRT+T 20kV Orig. / Repl. f. / Repl. by	SIEMENS	8DJH 8DJH 8DJH-82141 Single Line Diagram	T13017	=J00 +J00 / B01 Sh.No 01-1
				Created by	Kitanov					
				Checked by						
Issue	Revision	Date	Name	Standard						

FRONT VIEW

=J01	=J02	=J03	=J04	=J05
+J01	+J02	+J03	+J04	+J05
=JZ01	=JZ02	=JZ02	=JZ03	=JZ04



LOAD DATA AND MINIMUM DISTANCES

1.) MAX. PERMANENT LOADS
Fv VERTICAL SINGLE LOAD

PANEL WIDTH 310 mm	1,6 kN
PANEL WIDTH 430 mm	3,0 kN
PANEL WIDTH 500 mm	4,0 kN
PANEL WIDTH 640 mm	3,5 kN

2.) NON PERMANENT LOADS

pa	MAX LIVE LOAD	6 kN/m²

3.) MINIMUM DISTANCES

WALL CLEARANCE REAR	≥ 15 mm
WALL CLEARANCE LEFT / RIGHT	≥ 50 mm
WITH EXTENSION	≥ 200 mm

4.) HEIGHT OF CEILING

SWITCHGEAR HEIGHT 1400 mm *	≥ 2000 mm
SWITCHGEAR HEIGHT 2000 mm / 2300 mm	≥ 2400 mm

5.) MINIMUM DOOR OPENING

SWITCHGEAR HEIGHT ≤ 1700 mm *	1000 mm x 2000 mm
SWITCHGEAR HEIGHT 2000 mm	1000 mm x 2200 mm
SWITCHGEAR HEIGHT 2300 mm	1200 mm x 2500 mm

* WITHOUT CABLE DUCT OR LV-CABINET

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System/rated frequency	Operating voltage	Rated voltage	Rated short-time withst. curr.	Rated normal current
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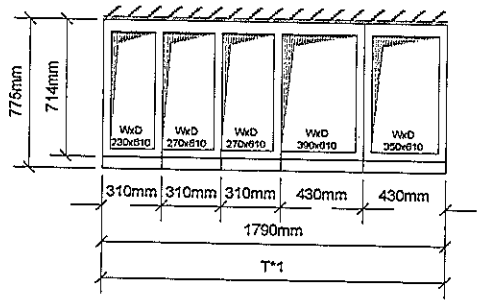
				Date	23.07.2013	CEZ	SIEMENS	8DJH	T13017	=J00	
				Created by	Kitanov			8DJH		+J00	B01
				Checked by		RRRT+T 20kV		8DJH-82141			Sh.No 01-
Issue	Revision	Date	Name	Standard		Orig. / Repl. f. / Repl. by		Location diagram			1

PLAN VIEW

=J01	=J02	=J03	=J04	=J05
+J01	+J02	+J03	+J04	+J05
=JZ01	=JZ02	=JZ02	=JZ03	=JZ04



LOAD DATA AND MINIMUM DISTANCES

1.) MAX. PERMANENT LOADS
Pv VERTICAL SINGLE LOAD
- PANEL WIDTH 310 mm: 1.8 kN
- PANEL WIDTH 430 mm: 3.0 kN
- PANEL WIDTH 500 mm: 4.0 kN
- PANEL WIDTH 840 mm: 3.5 kN

2.) NON PERMANENT LOADS
pa MAX LIVE LOAD: 0 kN/m²

3.) MINIMUM DISTANCES
- WALL CLEARANCE REAR: ≥ 15 mm
- WALL CLEARANCE LEFT / RIGHT: ≥ 50 mm
- WITH EXTENSION: ≥ 200 mm

4.) HEIGHT OF CEILING
- SWITCHGEAR HEIGHT 1400 mm *: ≥ 2000 mm
- SWITCHGEAR HEIGHT 2000 mm / 2300 mm: ≥ 2400 mm

5.) MINIMUM DOOR OPENING
- SWITCHGEAR HEIGHT ≤ 1700 mm *: 1000 mm x 2000 mm
- SWITCHGEAR HEIGHT 2000 mm: 1000 mm x 2200 mm
- SWITCHGEAR HEIGHT 2300 mm: 1200 mm x 2500 mm

* WITHOUT CABLE DUCT OR LV-CABINET

THESE CONSTRUCTIONAL DATA OF SIEMENS AG ARE NOT BINDING FOR CONSTRUCTION. THEY ARE ONLY VALID AS A BASE FOR PRODUCTION OF BINDING CONSTRUCTIONAL DRAWINGS. FURTHER INFORMATION ACCORDING CONSTRUCTIONAL DATA CAN BE FOUND IN THE RELATED OPERATING AND INSTRUCTION MANUAL.

				Date	23.07.2013		
				Created by	Klanov	CEZ	
				Checked by		RRRT+T 20kV	
Issue	Revision	Date	Name	Standard		Orig. / Repl. f. / Repl. by	

SIEMENS

8DJH
8DJH
8DJH-82141

Constructional Data

T13017

=J00
+J00
B01
Sh.No 01-

System/rated frequency	Operating voltage	Rated voltage	Rated short-time withst. curr.	Rated normal current
3~50 Hz	20.0 kV	24.0 kV	16.0 kA (1 s)	630 A

Приложение 43

SIEMENS

Тип: 8DJH – RRT Година на производство: Януари 2009			
Заводски номер: CV 777777-000060/003 J05			
IEC 60265-1, 62271-1/-102/-105/-200			
Ur=24kV	**Up=125kV**	**Ud=50kV**	**f_r=50Hz**
Im=Ip=40kA	**Ik=16kA**	**t_k=1s**	
Busbar:	**Ir=630A**		
IAC FLR 16kA 1s			
ИЗВОД КАБЕЛ			
Ir=630A	Mr=M1	Er=E2	n=100
Ua = DC 24V			
ИЗВОД ТРАНСФОРМАТОР			
Mr=M1	Er=E2	n=100	
Номинален ток на предпазителя: виж съотв. Таблица			
Ua = DC 125V			
Херметично затворена система под налягане			
Налягане на пълнене:	150 kPa/20°C (абсолютно)		
Доп. околна температура:	-5/55°C		
Количество SF6:	макс.1,3кг.		
Инструкция за експлоатация:	500-8070.9		

SIEMENS AG
MADE IN GERMANY

AP

Приложение 45

SIEMENS

TÜVRheinland

Списък на типовите изпитания

съгласно IEC/EN 62271-200

към оферта по търг

Идентификационен номер: 8DJH-012-090924-e **Съдържание:** 1 стр.

Обект на изпитванията: SF $_6$-изолиран, метално-капсулован панел вход/изход тип R на КРУ средно напрежение (24 kV; 630 A; 16 kA / 1 s)

Тип изпитване	Тип документ	Номер на документа
Изпитвания на изолацията	Протокол от изпитването	0877Fr-3
Изпитвания на температурна устойчивост Измерване на съпротивлението на главната верига	Протокол от изпитването	08116Fr
Изпитвания на токовете на термична и динамична устойчивост - на главните вериги - на заземителните вериги	Протокол от изпитването	0886Fr
Проверка на изключвателната и включвателната възможности	Сертификат Протокол от изпитването	KEMA 133-07 0818Bm
Изпитвания на механична устойчивост: - на комутационните устройства - на блокировките - на правилното функциониране на устройството за индикация на положението	Протокол отизпитването Протокол от изпитването Протокол от изпитването	08117Fr-1 08117Fr-2 08130Fr
Проверка на степента на защита	Протокол от изпитването	08122Fr
Изпитвания на херметичността	Протокол от изпитването	08121Fr
Изпитване на устойчивост на налягане	Протокол от изпитването	0880Fr
Изпитване на устойчивост на вътрешна електрическа дъга (когато е приложимо) - в комутационното отделение, напълнено с газ - в отделението на кабелните присъединения	Протокол от изпитването Протокол от изпитването	0846Fr 0850Fr

Гореописаната комплектна разпределителна уредба отговаря на стандартите, цитирани в съответните тестови документи.

Списъкът може да съдържа тестови документи, които се отнасят за КРУ с различни технически параметри. Тези документи също са валидни за гореописания обект на изпитванията.

София, 20.02.2013 г.

Инж. Боряна Манолова
/Управител/

СИМЕНС ЕООД София

Нели Станоева
/Прокурист/

SIEMENS

TÜVRheinland

Списък на типовите изпитания

съгласно IEC/EN 62271-200

към оферта по търг

Идентификационен номер: 8DJH-011-090806-e **Съдържание:** 1 стр.

Обект на изпитванията: SF $_6$-изолиран, метално-капсулован панел трансформаторен извод тип T на КРУ средно напрежение (24 kV; 630/200 A; 16 kA / 1 s)

Тип изпитване	Тип документ	Номер на документа
Изпитвания на изолацията	Протокол от изпитването	0861Fr
Изпитвания на температурна устойчивост Измерване на съпротивлението на главната верига	Протокол от изпитването	0862Fr
Изпитвания на токовете на термична и динамична устойчивост - на главните вериги - на заземителните вериги	Протокол от изпитването	0867Fr
Проверка на изключвателната и включвателната възможности	Сертификат Сертификат	KEMA 138-07 KEMA 146-07
Изпитвания на механична устойчивост: - на комутационните устройства - на блокировките - на правилното функциониране на устройството за индикация на положението	Протокол отизпитването Протокол от изпитването Протокол от изпитването Протокол от изпитването	08117Fr-1 08117Fr-3 08117Fr-2 08120Fr
Проверка на степента на защита	Протокол от изпитването	08122Fr
Изпитвания на херметичността	Протокол от изпитването	08121Fr
Изпитване на устойчивост на налягане	Протокол от изпитването	0879Fr
Изпитване на устойчивост на вътрешна електрическа дъга (когато е приложимо) - в комутационното отделение, напълнено с газ - в отделението на кабелните присъединения	Протокол от изпитването Протокол от изпитването	0883Fr 0813Bm

Гореописаната комплектна разпределителна уредба отговаря на стандартите, цитирани в съответните тестови документи.

Списъкът може да съдържа тестови документи, които се отнасят за КРУ с различни технически параметри. Тези документи също са валидни за гореописания обект на изпитванията.

София, 20.02.2013 г.

Инж. Боряна Манолова
/Управител/

СИМЕНС АД София

Вели Станоева
/Прокурист/

Приложение 46

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 0877Fr-3 **Copy No.:** 0 **Contents:** 20 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH
consisting of cable panel type -K-, bus sectionalizer panel type -S- and ring-main panel type -R-

Designation: Ring-main panel type -R-

Rated voltage:	24 kV	Rated normal current:	630 A	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA/ 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 17 July 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.2.6	DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6.2.6
IEC 62271-1: 2007-10, clause 6.2.6	DIN IEC 62271-1 (VDE 0671 Teil 1) Entwurf: 2004-12, Abschnitt 6.2.6

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Dielectric tests"

1. Power frequency voltage test 50 Hz; 50 kV - 1 min between phases and to earth and across the contact gap and 60 kV 1 min at the isolating distance
2. Lightning impulse voltage test 1,2/50 µs; ± 125 kV between phases and to earth and across the contact gap and ± 145 kV at the isolating distance

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

PEHLA GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 3 September 2008

02PE0804

Deutscher Akkreditierungs Rat
DAR
DAT-P-013/92-54

Notes

Accreditation

The PEHLA-Testing Laboratory Frankfurt am Main has been approved by the DATech (German accreditation body for technology) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. DAT-P-013/92-54).

STL-Member

PEHLA is founder member of the SHORT-CIRCUIT TESTING LIAISON (STL) which has been established in 1969. STL is a forum for the international cooperation of the testing organisations with the further full members ASTA (UK), CESI (IT), CPRI (IND), ESEF (FR), KEMA (NL), SATS (NO, SE, FI), STLNA (US, CA) and JSTC (JP). In the framework of EC, STL (EU) has been recognised in 1992 by EOTC as agreement group.

PEHLA-Documents

A Type Test Certificate

is issued for type tests which have successfully been carried out in full compliance with the relevant specifications or standards and STL Guides valid at the time of the test. For these tests the test object must be clearly identified by technical description, drawings and additional specifications.

A Test Document

is issued for parts of type tests which have successfully been carried out in full compliance with the relevant specifications or standards and STL Guides valid at the time of test. For these tests the test object must be clearly identified by technical description, drawings and additional specifications.

A Test Report

is issued for all other tests which have been carried out according to specifications, standards or "PEHLA-Richtlinien" (PEHLA Guides) and/or clients' instructions. Similarly, this test report contains all test results, details of the conditions under which the tests were carried out, also details relating to the behaviour of the test object, and its condition after the tests.

A Test Confirmation

is issued immediately after the tests. It confirms that the tests have been conducted and is valid only until publishing the detailed results in an entire document.

Uncertainty of the measurement systems

The PEHLA - Testing Laboratories apply the PEHLA Guide No. 12 for determining the uncertainties of measurement, based on ENV 13005 (Guide to the expression of uncertainty in measurement). As long as no explicit statements are made, the uncertainties required by the relevant standards have been complied with.

Addresses

Office:	PEHLA-Geschäftsstelle Hallenweg 40 68219 Mannheim Germany Internet: www.pehla.com
Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Manufacturer:	Siemens AG E D MV Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Client:	Siemens AG E D MV 2 Carl-Benz-Straße 22 60386 Frankfurt am Main Germany

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 08116Fr **Copy No.:** 0 **Contents:** 37 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH, consisting of circuit-breaker panel type -L-, transformer panel type -T- and ring-main panel type -R-

Designation: Circuit-breaker panel type -L- and ring-main panel type -R-

Rated voltage:	24 kV	Rated normal current:	630 A / 180 A 1)	Rated frequency:	50 Hz
Rated peak withstand current:	40 kA	Rated short-time withstand current:	16 kA	Rated duration of short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse-link.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 1 to 11 September 2008

Applied test specifications:

IEC 62271-200: 2003-11,
clauses 6.4.1, 6.5.1 - 6.5.4 and 6.5.6
IEC 62271-1: 2007-10,
clauses 6.4.1, 6.5.1 - 6.5.4 and 6.5.6
IEC 62271-105: 2002-08,
clauses 6.4 and 6.5

DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10,
Abschnitte 6.4.1, 6.5.1 - 6.5.4 und 6.5.6
DIN EN 62271-1 (Entwurf): 2004-12 (VDE 0671 Teil1),
Abschnitte 6.4.1, 6.5.1 - 6.5.4 und 6.5.6
DIN EN 62271-105 (VDE 0671 Teil 105): 2003-12,
Abschnitte 6.4 und 6.5

According to STL Objectives and Operating Principles PEHLA Issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Temperature-rise type test:
1. Measurement of the resistance of the main circuit before the temperature-rise test
2. Temperature-rise test at the rated normal current of 630 A / 50 Hz of the circuit-breaker panel type -L- and of the ring-main panel type -R-
3. Measurement of the resistance of the main circuit after the temperature-rise test

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

PEHLA GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 14 October 2008

02PE0804

Deutscher Akkreditierungs Rat DAR

DAT-P-013/92-54

Notes

Accreditation

The PEHLA-Testing Laboratory Frankfurt am Main has been approved by the DATech (German accreditation body for technology) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. DAT-P-013/92-54).

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PEHLA-Documents

A Type Test Certificate

is issued for type tests which have successfully been carried out in full compliance with the relevant specifications or standards and STL Guides valid at the time of the test. For these tests the test object must be clearly identified by technical description, drawings and additional specifications.

A Test Document

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is issued for all other tests which have been carried out according to specifications, standards or "PEHLA-Richtlinien" (PEHLA Guides) and/or clients' instructions. Similarly, this test report contains all test results, details of the conditions under which the tests were carried out, also details relating to the behaviour of the test object, and its condition after the tests.

A Test Confirmation

is issued immediately after the tests. It confirms that the tests have been conducted and is valid only until publishing the detailed results in an entire document.

Uncertainty of the measurement systems

The PEHLA - Testing Laboratories apply the PEHLA Guide No. 12 for determining the uncertainties of measurement, based on ENV 13005 (Guide to the expression of uncertainty in measurement). As long as no explicit statements are made, the uncertainties required by the relevant standards have been complied with.

Addresses

Office:	PEHLA-Geschäftsstelle Hallenweg 40 68219 Mannheim Germany Internet: www.pehla.com
Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Manufacturer:	Siemens AG E D MV Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Client:	Siemens AG E D MV 2 Carl-Benz-Straße 22 60386 Frankfurt am Main Germany

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 0886Fr **Copy No.:** 0 **Contents:** 23 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH
consisting of ring-main panel type -R- and cable panel type -K-

Designation: Ring-main panel type -R-

Rated voltage:	24 kV	Rated normal current:	630 A	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 24 July 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.6	DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6.6
IEC 62271-1: 2007-10, clause 6.6.	DIN EN 62271-1 (Entwurf): 2004-12 (VDE 0671 Teil1), Abschnitt 6.6

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Short-time and peak withstand current test" at 50 Hz

- Test on main circuits
- Test on earthing circuits
- Test on earthing circuit of the enclosure

(continued on sheet 3)

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 15 December 2008

02PE0804

Deutscher Akkreditierungs Rat
DAR
DAT-P-013/92-54

Notes

Accreditation

The PEHLA-Testing Laboratory Frankfurt am Main has been approved by the DATech (German accreditation body for technology) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. DAT-P-013/92-54).

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PEHLA is founder member of the SHORT-CIRCUIT TESTING LIAISON (STL) which has been established in 1969. STL is a forum for the international cooperation of the testing organisations with the further full members ASTA (UK), CESI (IT), CPRI (IND), ESEF (FR), KEMA (NL), SATS (NO, SE, FI), STLNA (US, CA) and JSTC (JP). In the framework of EC, STL (EU) has been recognised in 1992 by EOTC as agreement group.

PEHLA-Documents

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A Test Document

is issued for parts of type tests which have successfully been carried out in full compliance with the relevant specifications or standards and STL Guides valid at the time of test. For these tests the test object must be clearly identified by technical description, drawings and additional specifications.

A Test Report

is issued for all other tests which have been carried out according to specifications, standards or "PEHLA-Richtlinien" (PEHLA Guides) and/or clients' instructions. Similarly, this test report contains all test results, details of the conditions under which the tests were carried out, also details relating to the behaviour of the test object, and its condition after the tests.

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is issued immediately after the tests. It confirms that the tests have been conducted and is valid only until publishing the detailed results in an entire document.

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Addresses

Office:
PEHLA-Geschäftsstelle
Hallenweg 40
68219 Mannheim
Germany
Internet: www.pehla.com

Testing Station:
PEHLA-Testing Laboratory
Frankfurt am Main
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Manufacturer:
Siemens AG
Energy Sector
E D MV
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Client:
Siemens AG
Energy Sector
E D MV 2
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Tests performed

(Continuation from sheet 1)

Test 0886Fr-03

From the bushings of ring-main outgoing feeder -R- across the three-position switch disconnector SD in "ON" position to the bushings of cable outgoing feeder -K- with I_p = 57,1kA; I_k = 21,4kA – 3,02s (corresponding to I_k = 21,0kA – 3,13s)

Test 0886Fr-04

From the bushings of ring-main outgoing feeder -R- to the three-position switch disconnector SD in "EARTHED" position with I_p = 57,7kA; I_k = 21,2kA – 3,01s (corresponding to I_k = 21,0kA - 3,07s)

Test 0886Fr-05

Single phase from the bushing L3 of ring-main outgoing feeder -R- across the three-position switch disconnector SD in "EARTHED" position to the earthing connection (M12) of the earthing busbar in the cable outgoing feeder -K- with I_p = 57,2kA; I_k = 21,7kA – 1,00s (corresponding to I_k = 21,0kA – 1,07s)

Test 0886Fr-06

Single phase from the earthing connection (M12) of the earthing busbar in the ring-main outgoing feeder -R- to the earthing connection (M12) of the earthing busbar in the cable outgoing feeder -K- with I_p = 57,1kA; I_k = 21,7kA – 1,01s (corresponding to I_k = 21,0kA – 1,08s)

133-07

TYPE TEST CERTIFICATE OF SHORT-CIRCUIT AND SWITCHING PERFORMANCE

APPARATUS	A three-phase three-position load break switch-disconnector in an SF_6-insulated metal-enclosed switchgear, type 8DJH
DESIGNATION	8DJH R **SERIAL No.** RK4 and RK5

Rated voltage	24 kV (1)	Rated normal current	630 A
Rated short-circuit current	20 kA	Rated frequency	50 Hz

(1) See note on page 6.

MANUFACTURER	Siemens AG, PTD M 2, Frankfurt am Main, Germany
TESTED FOR	Siemens AG, PTD M 2, Frankfurt am Main, Germany
TESTED BY	KEMA HIGH-POWER LABORATORY Utrechtseweg 310 - 6812 AR Arnhem - The Netherlands
DATE(S) OF TESTS	17, 18, 19, 25, 26 and 29 October 2007

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in this Certificate, has been subjected to the series of proving tests in accordance with

IEC 60265-1, subclause 6.6 (STC), 6.101 (Mainly active load current (100% and 5%), Cable-charging current (100% and 30%), Duty 5, 6a, 6b and Closed-loop distribution and Earth fault test)

This Type Test Certificate has been issued by KEMA following exclusively the STL Guides.

The results are shown in the record of Proving Tests and the oscillograms attached hereto. The values obtained and the general performance are considered to comply with the above Standard(s) and to justify the ratings assigned by the manufacturer as listed on page 6.

The Certificate applies only to the apparatus tested. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

This Certificate consists of 329 sheets in total.

This Certificate falls under the scope of the accreditation certificate L 020 of the Dutch Council for Accreditation. See information sheet (page 2).

KEMA Nederland B.V.

P.G.A. Bus
KEMA T&D Testing Services
Managing Director

Arnhem, 13 February 2009

Version: 1

1 Certificate

A Certificate contains a record of a series of type tests carried out strictly in accordance with a recognized standard. The equipment tested has fulfilled the requirements of this standard and the relevant ratings assigned by the manufacturer are endorsed by KEMA. The Certificate is applicable only to the equipment tested. KEMA is responsible for the validity and the contents of the Certificate.
The responsibility for conformity of any apparatus having the same designation as the one tested rests with the manufacturer. The Certificate contains the essential drawings and a description of the equipment tested.
Detailed rules are given in KEMA's Certification procedure.

2 Report of Performance

A Report of Performance contains a record of one or more tests which have been carried out according to the client's instructions. These tests are not necessarily in accordance with a recognized standard. The test results do not verify ratings of the test object.

KEMA issues three types of Reports of Performance:

***2.1** The tests have been carried out strictly in accordance with .... The apparatus has complied with the relevant requirements.*

This sentence will appear on the front page of a Report of Performance if the tests have been performed in accordance with a recognized standard, but the series of tests does not completely fulfil the requirements for a Certificate of Compliance (for example, if the number of test duties is not a complete series of type tests). The Report contains verified drawings and a description of the equipment tested. Detailed rules are given in KEMA's Certification procedure. The condition of the test object after the tests is assessed and recorded in the Report.

***2.2** The tests have been carried out in accordance with the client's instructions. Test procedure and test parameters were based on ....*

This sentence will appear on the front page of a Report of Performance if the number of tests, the test procedure and the test parameters are based on a recognized standard and related to the ratings assigned by the manufacturer. If the apparatus does not pass the tests such behaviour will be mentioned on the front sheet. Verification of the drawings (if submitted) and assessment of the condition after the tests is only done on the client's request.

***2.3** The tests have been carried out according to the client's instructions.*

This sentence will appear on the front page of a Report of Performance if the tests, test procedure and/or test parameters are not in accordance with a recognized standard.

3 Standards

When reference is made to a standard, and the date of issue is not stated, this applies to the latest issue, including amendments which have been officially published prior to the date of the tests.

4 Official and uncontrolled test documents

The official test documents of KEMA High-Power Laboratory are issued in bound form. Uncontrolled copies may be provided as loose sheets or as a digital file for convenience of reproduction by the client. The copyright has to be respected at all times.

5 Accuracy of measurement

In the table of test results the measured quantities are given in three digits. This method of presentation does not indicate an accuracy. The guaranteed uncertainty in the figures mentioned, taking into account the total measuring system, is less than 5%, unless mentioned otherwise.

6 Qualified by RvA (Dutch Council for Accreditation)

KEMA High-Power Laboratory and High-Voltage Laboratory have been entered in the RvA-register for laboratories under resp. Nrs. L 020 and L 218 for the testing services as defined in the Field of Accreditation.
The accreditation is carried out in accordance with ISO/IEC 17025.

TABLE OF CONTENTS:

RATINGS ASSIGNED BY THE MANUFACTURER

Voltage	24 kV (1)	
Normal current	630 A	
Number of poles	3	
Frequency	50 Hz	X
Short-time withstand current	20 kA	X
Peak withstand current	50 kA	X
Duration of short-circuit	3 s	X
Short-circuit making current	50 kA	X
Mainly active load breaking current	630 A	X
Closed-loop breaking current	630 A	X
Cable-charging breaking current	63 A	X
Cable-charging breaking current under conditions	109 A	X
Earth-fault breaking current	189 A	X
Pressure for interruption SF_6 at 20 °C	0,15 MPa	
Pressure for insulation SF_6 at 20 °C	0,15 MPa	
Type of switch	General purpose switch	
Class	E3	X

X = This rating has been proved by the tests of this Certificate.

(1) On request of the client, the tests have been based on a voltage of 25 kV.

DESCRIPTION OF APPARATUS TESTED

A three-phase three-position load break switch-disconnector in an SF_6-insulated metal-enclosed switchgear, type 8DJH

Minimum pressure for interruption at 20 °C	0,13 MPa
Maximum pressure for interruption at 20 °C	0,15 MPa

Mechanism:

Independent manual closing (springs).
Independent manual opening (springs).
For test purposes operated by pneumatic system, therefore no values of the opening and closing times are given in this report.

TRAVEL RECORDER

Travel recorder attached to main contact shaft. Linear with contact travel.

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Confirmation

Report No.: 0818Bm-0 **Copy No.:** 0 **Contents:** 1 Sheets

Test object: Gas - Insulated Switchgear Type 8DJH
consisting of ring-main panel type -R- and cable panel type -K-

Designation: Three-position switch-disconnector of ring-main panel type -R-

Rated voltage:	24 kV	Rated normal current:	630 A	Rated frequency:	50 / 60 Hz
Rated peak withstand current:	54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

Serial No.: TP3
Drawing No.: 500-8000.9

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Berlin-Marzahn

Date of test: 14. August 2008

Applied test specifications:

IEC 60265-1: 1998-01, clause 6.101.10 — DIN EN 60265-1 (VDE 0670 Teil 301): 1999-05, Abschnitt 6.101.10

IEC 62271-102: 2001-12, clause 6.101 — DIN EN 62271-102 (VDE 0671 Teil 102): 2003-10, Abschnitt 6.101

Tests performed:

Type Test "Making and breaking tests"

1. 10 make-break operating cycles with the switch-disconnector function at mainly active load current I_1 = 630 A at test voltage of 25 kV
2. 5 making operations with the switch-disconnector function at short-circuit making current I_{ma} = 54,6 kA at test voltage of 25 kV
3. 5 making operations with the earthing-switch function at short-circuit making current I_{ma} = 54,6 kA at test voltage of 25 kV

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

Achieved electrical endurance class of the disconnector (according IEC 60265-1): E3

Achieved electrical endurance class of the earthing switch (according IEC 62271-102): E2

Detailed results will be documented in a separate document.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Stommel Moritz

Observers of the test
Representatives of Technical Committee

Berlin-Marzahn, 14. August 2008

Deutscher Akkreditierungs Rat
DAR
DAT-P-019/92-63

Notes

Accreditation

The PEHLA-Testing Laboratory Frankfurt am Main has been approved by the DATech (German accreditation body for technology) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. DAT-P-019/92-63).

STL-Member

PEHLA is founder member of the SHORT-CIRCUIT TESTING LIAISON (STL) which has been established in March 1969. STL is a forum for the international cooperation of the testing organisations with the further full members ASTA (UK), CESI (IT), ESEF (FR), KEMA (NL), SATS (NO; SE, FI), STLNA (US, CA) and JSTC (JP). In the framework of EC, STL (EU) has been recognised in 1992 by EOTC as agreement group.

PEHLA-Documents

A Type Test Certificate

is issued for type tests which have successfully been carried out in full compliance with the relevant specifications or standards and STL Guides valid at the time of the test. For these tests the test object must be clearly identified by technical description, drawings and additional specifications.

A Test Document

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A Test Confirmation

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Uncertainty of the measurement systems

The PEHLA - Testing Laboratories apply the PEHLA Guide No. 12 for determining the uncertainties of measurement, based on ENV 13005 (Guide to the expression of uncertainty in measurement). As long as no explicit statements are made, the uncertainties required by the relevant standards have been complied with.

Addresses

Office:
PEHLA-Geschäftsstelle
Hallenweg 40
68219 Mannheim
Deutschland
Internet: www.pehla.com

Testing Station:
PEHLA-Testing Laboratory
Berlin-Marzahn
Landsberger Allee 378A
12681 Berlin
Deutschland

Manufacturer:
Siemens AG
Energy Sector
E D MV
Carl-Benz-Straße 22
60386 Frankfurt am Main
Deutschland

Client:
Siemens AG
Energy Sector
E D MV 2
Carl-Benz-Straße 22
60386 Frankfurt am Main
Deutschland

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 08117Fr-1 **Copy No.:** 0 **Contents:** 16 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH

Designation: Ring-main transformer panel block type RRT

Rated voltage:	24 kV	Rated normal current:	630A / 180A	1)	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21kA		Rated duration of short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 20 to 24 September 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6	DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6
IEC 60265-1: 1998-11, clause 6.102	DIN EN 60265-1 (VDE 0670 Teil 301): 1999-05, Abschnitt 6.102
IEC 62271-102: 2003-08 clause 6.102	DIN EN 62271-102 (VDE 0671 Teil 102): 2004-10, Abschnitt 6.102

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Mechanical operation test"

1000 On-Off operations with the switch-disconnector of ring-cable feeder R1 for class M1
1000 Earth-Off operations with the make proof earthing switch of ring-cable feeder R1
1000 On-Off operations with the switch-disconnector of transformer feeder T1 for class M1
1000 Earth-Off operations with the make proof earthing switch of transformer feeder T1

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN – PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 11 March 2009

Deutscher Akkreditierungs Rat DAR DAT-P-013/92-54

ПС Електрик ООД PS ELECTRIC BULGARIA

Notes

Accreditation

The PEHLA-Testing Laboratory Frankfurt am Main has been approved by the DATech (German accreditation body for technology) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. DAT-P-013/92-54).

STL-Member

PEHLA is founder member of the SHORT-CIRCUIT TESTING LIAISON (STL) which has been established in 1969. STL is a forum for the international cooperation of the testing organisations with the further full members ASTA (UK), CESI (IT), CPRI (IND), ESEF (FR), KEMA (NL), SATS (NO, SE, FI), STLNA (US, CA) and JSTC (JP). In the frame-work of EC, STL (EU) has been recognised in 1992 by EOTC as agreement group.

PEHLA-Documents

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A Test Confirmation

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Uncertainty of the measurement systems

The PEHLA - Testing Laboratories apply the PEHLA Guide No. 12 for determining the uncertainties of measurement, based on ENV 13005 (Guide to the expression of uncertainty in measurement). As long as no explicit statements are made, the uncertainties required by the relevant standards have been complied with.

Addresses

Office:
PEHLA-Geschäftsstelle
Hallenweg 40
68219 Mannheim
Germany
Internet: www.pehla.com

Testing Station:
PEHLA-Testing Laboratory
Frankfurt am Main
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Manufacturer:
Siemens AG
Energy Sector
E D MV
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Client:
Siemens AG
Energy Sector
E D MV 2
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

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PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 08117Fr-2 **Copy No.:** 0 **Contents:** 16 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH

Designation: Ring-main transformer panel block type RRT

Rated voltage:	24 kV	Rated normal current:	630 A / 180 A	1)	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA		Rated duration of short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 20 - 24 September 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.102

DIN EN 62271-200 (VDE 0671 Teil 200): 2004-09, Abschnitt 6.102

According to STL Objectives and Operating Principles PEHLA Issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Mechanical operation tests"

1. Switching devices and removable parts.
   The three-position switches of ring-main feeder R1 and transformer feeder T1 were operated 50 times.
2. Interlocks.
   The mechanical interlocks between three-position disconnector, "feeder" locking device (padlock) and cover of the cable compartment of ring-main feeder R1 and transformer feeder T1 were tested 50 times.

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 16 March 2009

02PE0804

Deutscher Akkreditierungs-Rat DAT-P-013/92-54

ПС електрик ООД PS ELECTRIC BULGARIA

Notes

Accreditation

The PEHLA-Testing Laboratory Frankfurt am Main has been approved by the DATech (German accreditation body for technology) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. DAT-P-013/92-54).

STL-Member

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PEHLA-Documents

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Client:
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60386 Frankfurt am Main
Germany

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 08130Fr **Copy No.:** 0 **Contents:** 14 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH

Designation: Ring-main transformer panel block type RRT

Rated voltage:	24 kV	Rated normal current:	630 A / 180 A 1)	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 08. Oktober 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6	DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6
IEC 62271-102: 2003-08, clause 6.105	DIN EN 62271-102 (VDE 0671 Teil 102): 2003-10, Abschnitt 6.105

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test „Tests to verify the proper function of the position-indicating device"
The tests were carried out on the ring-cable feeder R1

- Test on the power resp. position-indicating kinematic chain of the disconnector with independent manual operation
- Test on the power resp. position-indicating kinematic chain of the earthing-switch with independent manual operation

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 20 March 2009

Deutscher Akkreditierungs Rat DAR DAT-P-013/92-54

Notes

Accreditation

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PEHLA-Documents

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Client:
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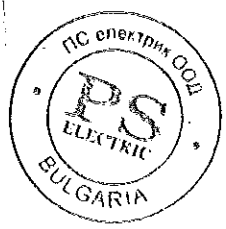

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 08122Fr-1 **Copy No.:** 0 **Contents:** 13 Sheets

Test object: Gas - Insulated Switchgear Type 8DJH

Designation: Ring-main transformer panel block type RRT

Rated voltage:	24 kV	Rated normal current:	630 A / 180 A 1)	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 23 September 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.7.1	DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6.7.1
IEC 62271-1: 2007-10, clause 6.7.1	DIN IEC 62271-1 (VDE 0671 Teil 1) Entwurf: 2004-12, Abschnitt 6.7.1
IEC 60529: 2003-01	DIN EN 60529 (VDE 0470 Teil 1): 2000-09

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Verification of the IP coding"
Protection of the enclosure of the Ring-main transformer panel block type RRT against access to hazardous parts and protection against solid foreign objects, degree of protection IP3X.

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 20 March 2009

02PE0804

Deutscher Akkreditierungs Rat
DAR
DAT-P-013/92-54

Notes

Accreditation

The PEHLA-Testing Laboratory Frankfurt am Main has been approved by the DATech (German accreditation body for technology) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. DAT-P-013/92-54).

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PEHLA-Documents

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Germany
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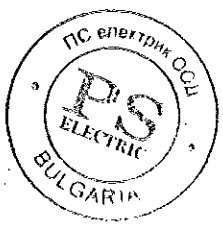

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 08121Fr **Copy No.:** 0 **Contents:** 12 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH

Designation: Ring-main transformer panel block type RRT

Rated voltage:	24 kV	Rated normal current:	630 A / 180 A	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 12 and 23 September 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.8	DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6.8
IEC 62271-1: 2007-10, clause 6.8	DIN IEC 62271-1 (VDE 0671 Teil 1) Entwurf: 2004-12, Abschnitt 6.8

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Tightness tests before and after mechanical operation test"

1. Tightness test of gas-filled compartment before the mechanical operation test
2. Mechanical operation tests with the ring-cable feeder R1 and R2 and with the transformer feeder T1 (1000 CLOSE - OPEN and 1000 EARTHED - OPEN operations)
3. Tightness test of gas-filled compartment after the mechanical operation test

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 04 February 2009

The test results relate only to the items tested.
The authenticity of this document is guaranteed by the integrity of the seal label and seal ribbon.
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02PE0804

Deutscher Akkreditierungs Rat DAR

DAT-P-013/92-54

Notes

Accreditation

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STL-Member

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PEHLA-Documents

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A Test Confirmation

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Uncertainty of the measurement systems

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Addresses

Office:	PEHLA-Geschäftsstelle Hallenweg 40 68219 Mannheim Germany Internet: www.pehla.com
Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Manufacturer:	Siemens AG Energy Sector E D MV Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Client:	Siemens AG Energy Sector E D MV 2 Carl-Benz-Straße 22 60386 Frankfurt am Main Germany

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 0880Fr **Copy No.:** 0 **Contents:** 9 **Sheets**

Test object: Gas – Insulated Switchgear Type 8DJH

Designation: Switchgear vessel of the ring main panel type -R-

Rated voltage:	up to 24 kV	Rated normal current:	up to 630 A	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	up to 62,5 kA	Rated short-time withstand current:	up to 25 kA	Rated duration of short-circuit:	up to 3 s

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 16 July 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.103

DIN EN 62271-200: 2004-10 (VDE 0671 Teil 200), Abschnitt 6.103

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type Test "Pressure withstand test for gas-filled compartments with pressure relief devices"

- The relative pressure was increased up to 110 kPa in order to reach a value of 1,3 times the design pressure of 85 kPa of the compartment for a period of 1 min. The pressure relief device did not operate.
- Then the pressure should have been increased up to a maximum value of 255 kPa (e.g. 3 times the design pressure of 85 kPa). The pressure relief device operated, as designed by the manufacturer, below this value. The reached opening overpressure was 212 kPa.

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN – PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 06 November 2008

Deutscher Akkreditierungs Rat DAR

DAT-P-013/92-54

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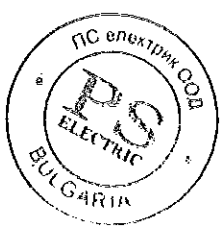
Client:	Siemens AG E D MV 2 Carl-Benz-Straße 22 60386 Frankfurt am Main Germany



PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 0846Fr **Copy No.:** 0 **Contents:** 22 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH
consisting of ring-main panel type -R- and cable panel type -K-

Designation: Ring-main panel type -R-

Rated voltage:	24 kV	Rated normal current:	630 A	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 10 June 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.106

DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6.106

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type Test "Internal arcing test" of the gas filled compartment

Testing under conditions of arcing due to an internal fault according classification IAC AFLR 21 kA 1 s.

Three-phase arc initiation within the switchgear vessel with a peak current of I_p = 53,5 kA and a short-circuit current of I_k = 21,7 kA – 1,01 s (I_k = 21,0 kA – 1,04 s accordingly).

(Continued on sheet 3)

Test results:

The assessment of the effects under condition of arcing due to an internal fault corresponding to the criteria 1 to 5 of the above mentioned test specification is compiled on sheet 3.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 06 August 2008

PS ELECTRIC

Deutsches Akkreditierungs Rat

DAR

DAT-P-013/92-54

Notes

Accreditation

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STL-Member

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Germany
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Frankfurt am Main
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Manufacturer:
Siemens AG
Energy Sector
E D MV
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Client:
Siemens AG
Energy Sector
E D MV 2
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Test performed

(Continuation from sheet 1)

The test on the medium voltage switchgear was performed for accessibility type A (restricted to authorized personal only).

The test of the free-standing panel took place in a room mock-up with an effective ceiling height of 2,00 m. The distance between the rear wall of the switchgear and the room mock-up was 0,80 m, between the top of the switchgear and the ceiling of the room mock-up was 0,60 m and between the right lateral wall and the room mock-up was 0,10 m.

Vertical indicators were arranged at a distance of 0,30 m.
The Indicators were arranged at three sides of the switchgear (front, left lateral and rear side), covering 40% to 50% of the area.

The three-phase infeeding of the current was in the cable connection compartment of cable panel type -K- via cables 240 mm^2.

Three-phase arc initiation was at the bushings for cable plug within the gas filled compartment of ring-main panel type -R-.

The pressure relief effected downwards into the cable basement mock-up.

The opening for the manual operation for the mechanism of the load-break switch function was in open position.

Test results

(Continuation from sheet 1)

Test-no. 0846Fr / 01

Criteria according to IEC 62271-200		fulfilled (yes/no)
No.1:	Correctly secured doors and covers do not open	yes
No.2:	No fragmentation of the enclosure occurs and no parts more than 60 g flow away	yes
No.3:	Arcing does not cause holes in the accessible sides up to a height of 2 m	yes
No.4:	Indicators do not ignite due to the effect of hot gases	yes
No.5:	The enclosure remains connected to its earthing point	yes

Test results: The test has been passed.

Achieved class of the gas filled compartment: IAC AFLR 21 kA 1 s.

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 0850Fr **Copy No.:** 0 **Contents:** 22 Sheets

Test object: Gas - Insulated Switchgear Type 8DJH
consisting of ring-main panel type -R- and cable panel type -K-

Designation: Ring-main panel type -R-

Rated voltage:	24 kV	Rated normal current:	630 A	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 11 June 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.106

DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6.106

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type Test "Internal arcing test" of the cable connection compartment

Testing under conditions of arcing due to an internal fault according classification IAC AFLR 21 kA 1 s.

Two-phase arc initiation within the cable connection compartment of ring-main panel -R- with a peak current of I_p = 45,9 kA and a short-circuit current of I_k = 18,5 kA – 1,01 s
(I_k = 18,3 kA = 21 kA × 0,87 – 1,02 s accordingly).

(Continued on sheet 3).

Test results:

The assessment of the effects under condition of arcing due to an internal fault corresponding to the criteria 1 to 5 of the above mentioned test specification is compiled on sheet 3.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 11 August 2008

02PE0804

Deutsche Akkreditierungs Rat

DAT-P-013/92-54

Notes

Accreditation

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STL-Member

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60386 Frankfurt am Main
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Manufacturer:
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Energy Sector
E D MV
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Client:
Siemens AG
Energy Sector
E D MV 2
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Test performed

(Continuation from sheet 1)

The test on the medium voltage switchgear was performed for accessibility type A (restricted to authorized personal only).

The test of the free-standing panel took place in a room mock-up with an effective ceiling height of 2,00 m. The distance between the rear wall of the switchgear and the room mock-up was 0,80 m, between the top of the switchgear and the ceiling of the room mock-up was 0,60 m and between the right lateral wall and the room mock-up was 0,10 m.

Vertical indicators were arranged at a distance of 0,30 m.
The Indicators were arranged at three sides of the switchgear (front, left lateral and rear side) and covering 40% to 50% of the area.

The three-phase infeeding of the current was in the cable connection compartment of cable panel type -K- via cables 240 mm^2.

The two-phase arc initiation between L1 and L2 was within the cable connection compartment of ring-main panel -R-.The cables of phase L1 and L2 were connected without plugs, phase L3 was connected with a T-plug type EUROMOLD K400TB.

The pressure relief effected downwards into the cable basement mock-up.

The opening for the manual operation for the mechanism of the load-break function was in open position.

Test results

(Continuation from sheet 1)

Test-no. 0850Fr / 01

Criteria according to IEC 62271-200		fulfilled (yes/no)
No.1:	Correctly secured doors and covers do not open	yes
No.2:	No fragmentation of the enclosure occurs and no parts more than 60 g flow away	yes
No.3:	Arcing does not cause holes in the accessible sides up to a height of 2 m	yes
No.4:	Indicators do not ignite due to the effect of hot gases	yes
No.5:	The enclosure remains connected to its earthing point	yes

Test results: The test has been passed.

Achieved class of the cable connection compartment: IAC AFLR 21 kA 1 s.

ПС електрик ООД PS ELECTRIC BULGARIA

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 0861Fr **Copy No.:** 0 **Contents:** 21 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH
consisting of transformer panel type -T- and cable panel type -K-

Designation: Transformer panel type -T-

Rated voltage:	24 kV	Rated normal current:	630 A / 180 A 1)	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 25 June 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.2.6	DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6.2.6
IEC 62271-1: 2007-10, clause 6.2.6	DIN IEC 62271-1 (VDE 0671 Teil 1) Entwurf: 2004-12, Abschnitt 6.2.6

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Dielectric tests"

1. Power frequency voltage test 50 Hz; 50 kV - 1 min between phases and to earth and across the contact gap and 60 kV - 1min at the isolating distance.
2. Lightning impulse voltage test 1,2/50 µs; ± 125 kV between phases and to earth and across the contact gap and ± 145 kV at the isolating distance.

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 14 August 2008

Deutscher Akkreditierungs Rat DAR

DAT-P-013/92-54

Notes

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Manufacturer:	Siemens AG E D MV Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Client:	Siemens AG E D MV 2 Carl-Benz-Straße 22 60386 Frankfurt am Main Germany

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 0862Fr **Copy No.:** 0 **Contents:** 30 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH

Designation: Ring-main transformer panel block type RRT

Rated voltage:	24 kV	Rated normal current:	630 A / 180 A 1)	Rated frequency:	50 Hz
Rated peak withstand current:	52,5 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 23 to 26 June 2008

Applied test specifications:

IEC 62271-200: 2003-11,
clauses 6.4.1, 6.5.1 - 6.5.4 and 6.5.6
IEC 62271-1: 2007-10,
clauses 6.4.1, 6.5.1 - 6.5.4 and 6.5.6
IEC 62271-105: 2002-08,
clauses 6.4 and 6.5

DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10,
Abschnitte 6.4.1, 6.5.1 - 6.5.4 und 6.5.6
DIN EN 62271-1 (Entwurf): 2004-12 (VDE 0671 Teil1),
Abschnitte 6.4.1, 6.5.1 - 6.5.4 und 6.5.6
DIN EN 62271-105 (VDE 0671 Teil 105): 2003-12,
Abschnitte 6.4 and 6.5

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

1. Temperature-rise type tests with following test currents:

Test No	Fuse-links in the transformer feeder 1 (T1)	Ring cable feeder 1 (R1)	Ring cable feeder 2 (R2)	Transformer feeder 1 (T1)
1.1	Siemens 3GD1 416-4D (24 kV / 80 A)	600 A / 50 Hz	630 A / 50 Hz	48 A / 50 Hz
1.2	Siemens 3GD1 232-4D (12 kV / 160 A)	575 A / 50 Hz	630 A / 50 Hz	76 A / 50 Hz

2. Measurement of the resistance of the main circuit before and after the temperature-rise tests.

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 12 August 2008

DAT-P-013/92-54

Notes

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A Test Confirmation

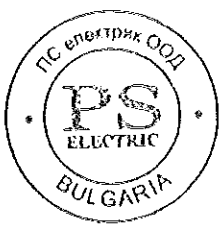
is issued immediately after the tests. It confirms that the tests have been conducted and is valid only until publishing the detailed results in an entire document.

Uncertainty of the measurement systems

The PEHLA - Testing Laboratories apply the PEHLA Guide No. 12 for determining the uncertainties of measurement, based on ENV 13005 (Guide to the expression of uncertainty in measurement). As long as no explicit statements are made, the uncertainties required by the relevant standards have been complied with.

Addresses

Office:	PEHLA-Geschäftsstelle Hallenweg 40 68219 Mannheim Germany Internet: www.pehla.com
Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Manufacturer:	Siemens AG E D MV Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Client:	Siemens AG E D MV 2 Carl-Benz-Straße 22 60386 Frankfurt am Main Germany



PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 0867Fr **Copy No.:** 0 **Contents:** 24 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH
consisting of transformer panel type -T- and cable panel type -K-

Designation: Transformer panel type -T-

Rated voltage:	24 kV	Rated normal current:	630 A / 160 A 1)	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 02 July 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.6	DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6.6
IEC 62271-1: 2007-10, clause 6.6.	DIN EN 62271-1 (Entwurf): 2004-12 (VDE 0671 Teil1), Abschnitt 6.6

According to STL Objectives and Operating Principles PEHLA Issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Short-time and peak withstand current test" at 50 Hz

- Test on main circuits
- Test on the earthing circuit of the enclosure
- Test of the earthing circuits

(continued on sheet 3)

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 15 December 2008

Akkreditierungs Rat

DAT-P-013/92-54

Notes

Accreditation

The PEHLA-Testing Laboratory Frankfurt am Main has been approved by the DATech (German accreditation body for technology) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. DAT-P-013/92-54).

STL-Member

PEHLA is founder member of the SHORT-CIRCUIT TESTING LIAISON (STL) which has been established in 1969. STL is a forum for the international cooperation of the testing organisations with the further full members ASTA (UK), CESI (IT), CPRI (IND), ESEF (FR), KEMA (NL), SATS (NO, SE, FI), STLNA (US, CA) and JSTC (JP). In the frame-work of EC, STL (EU) has been recognised in 1992 by EOTC as agreement group.

PEHLA-Documents

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Uncertainty of the measurement systems

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Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Manufacturer:	Siemens AG Energy Sector E D MV Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Client:	Siemens AG Energy Sector E D MV 2 Carl-Benz-Straße 22 60386 Frankfurt am Main Germany

Test performed

(Continuation from sheet 1)

Test no. 0867Fr-08
From the bushings of cable outgoing feeder -K- to the left hand busbar bushings of the transformer panel type -T- with I_p = 56,4 kA; I_k = 21,4 kA – 3,01 s (corresponding to I_k = 21,0 kA – 3,12 s).

Test no. 0867Fr-10
From the earthing connection M12 of the earthing busbar in the transformer outgoing feeder -T- to the earthing connection M12 of the earthing busbar in the cable outgoing feeder -K- with
I_p = 56,4 kA; I_k = 21,8 kA – 1,00 s (corresponding to I_k = 21,0 kA – 1,08 s).

Test no. 0867Fr-13
From the bushing L3 of transformer outgoing feeder -T- across the three-position switch disconnector SD in earthed position to the earthing connection M12 of the earthing busbar in the cable outgoing feeder -K- with I_p = 6,5 kA; I_k = 2,8 kA – 1,02 s (corresponding to I_k = 2,5 kA – 1,28 s).

ПС електрик ООД PS ELECTRIC BULGARIA

KEMA

138-07

TYPE TEST CERTIFICATE OF SHORT-CIRCUIT PERFORMANCE

APPARATUS A three-phase switch-fuse combination consisting of a three-position load break switch-disconnector in an SF_6-insulated metal-enclosed switchgear, type 8DJH

DESIGNATION 8DJH T **SERIAL No.** TR2

Rated voltage	24 kV	Rated normal current with fuses	100 A
Rated short-circuit breaking current	20 kA	Rated normal current of the switch	200 A
Rated take-over current	1300 A	Rated frequency	50 Hz

MANUFACTURER Siemens AG, PTD M 2,
Frankfurt am Main, Germany

TESTED FOR Siemens AG, PTD M 2,
Frankfurt am Main, Germany

TESTED BY KEMA HIGH-POWER LABORATORY
Utrechtseweg 310 - 6812 AR Arnhem - The Netherlands

DATE(S) OF TESTS 30 October 2007

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in this Certificate, has been subjected to the series of proving tests in accordance with

IEC 62271-105, subclauses 6.101.2.1 TD_{iso}, 6.101.2.2 TD_{lWmax} and 6.101.2.4 TD_{ITO}

This Type Test Certificate has been issued by KEMA following exclusively the STL Guides.

The results are shown in the record of Proving Tests and the oscillograms attached hereto. The values obtained and the general performance are considered to comply with the above Standard(s) and to justify the ratings assigned by the manufacturer as listed on page 5.

The Certificate applies only to the apparatus tested. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

This Certificate consists of 58 sheets in total.

This Certificate falls under the scope of the accreditation certificate L 020 of the Dutch Council for Accreditation.
See information sheet (page 2).

KEMA Nederland B.V.

P.G.A. Bus
KEMA T&D Testing Services
Managing Director

Arnhem, 13 February 2009

Version: 1

1 Certificate

A Certificate contains a record of a series of type tests carried out strictly in accordance with a recognized standard. The equipment tested has fulfilled the requirements of this standard and the relevant ratings assigned by the manufacturer are endorsed by KEMA. The Certificate is applicable only to the equipment tested. KEMA is responsible for the validity and the contents of the Certificate.
The responsibility for conformity of any apparatus having the same designation as the one tested rests with the manufacturer. The Certificate contains the essential drawings and a description of the equipment tested.
Detailed rules are given in KEMA's Certification procedure.

2 Report of Performance

A Report of Performance contains a record of one or more tests which have been carried out according to the client's instructions. These tests are not necessarily in accordance with a recognized standard. The test results do not verify ratings of the test object.

KEMA issues three types of Reports of Performance:

***2.1** The tests have been carried out strictly in accordance with .... The apparatus has complied with the relevant requirements.*

This sentence will appear on the front page of a Report of Performance if the tests have been performed in accordance with a recognized standard, but the series of tests does not completely fulfil the requirements for a Certificate of Compliance (for example, if the number of test duties is not a complete series of type tests). The Report contains verified drawings and a description of the equipment tested. Detailed rules are given in KEMA's Certification procedure. The condition of the test object after the tests is assessed and recorded in the Report.

***2.2** The tests have been carried out in accordance with the client's instructions. Test procedure and test parameters were based on ....*

This sentence will appear on the front page of a Report of Performance if the number of tests, the test procedure and the test parameters are based on a recognized standard and related to the ratings assigned by the manufacturer. If the apparatus does not pass the tests such behaviour will be mentioned on the front sheet. Verification of the drawings (if submitted) and assessment of the condition after the tests is only done on the client's request.

***2.3** The tests have been carried out according to the client's Instructions.*

This sentence will appear on the front page of a Report of Performance if the tests, test procedure and/or test parameters are not in accordance with a recognized standard.

3 Standards

When reference is made to a standard, and the date of issue is not stated, this applies to the latest issue, including amendments which have been officially published prior to the date of the tests.

4 Official and uncontrolled test documents

The official test documents of KEMA High-Power Laboratory are issued in bound form. Uncontrolled copies may be provided as loose sheets or as a digital file for convenience of reproduction by the client. The copyright has to be respected at all times.

5 Accuracy of measurement

In the table of test results the measured quantities are given in three digits. This method of presentation does not indicate an accuracy. The guaranteed uncertainty in the figures mentioned, taking into account the total measuring system, is less than 5%, unless mentioned otherwise.

6 Qualified by RvA (Dutch Council for Accreditation)

KEMA High-Power Laboratory and High-Voltage Laboratory have been entered in the RvA-register for laboratories under resp. Nrs. L 020 and L 218 for the testing services as defined in the Field of Accreditation.
The accreditation is carried out in accordance with ISO/IEC 17025.

TABLE OF CONTENTS:

RATINGS ASSIGNED BY THE MANUFACTURER

Voltage	24 kV	
Normal current with fuses	100 A	
Number of poles	3	
Frequency	50 Hz	X
Short-circuit breaking current	20 kA	X
Short-circuit making current	50 kA	X
Transfer current	1300 A	
Take-over current	1300 A	X
Pressure for interruption SF_6 at 20 °C	0,15 MPa	
Pressure for insulation SF_6 at 20 °C	0,15 MPa	

Fuse-link:

Manufacturer	SIBA
Designation	3002243.100 back-up fuse
Voltage	24 kV
Normal current	100 A
Breaking capacity	63 kA
Type of fuse striker	Medium
Certificate number	IPH 1244.0144.1.049, 19 September 2001

Only intended for use in earthed systems

X = This rating has been proved by the tests of this Certificate.

DESCRIPTION OF APPARATUS TESTED

A three-phase switch-fuse combination three-position load break consisting of a switch-disconnector in an SF_6-insulated metal-enclosed switchgear, type 8DJH

Minimum pressure for interruption at 20 °C	0,13 MPa
Maximum pressure for interruption at 20 °C	0,15 MPa

Mechanism:

Stored energy opening (springs, charged manually).
Stored energy closing (springs, charged manually).

Supply voltage closing coil	24 Vd.c.
Supply voltage opening coil	24 Vd.c.

TRAVEL RECORDER

Travel recorder attached to main contact shaft. Linear with contact travel.

ПС електрик ООД PS ELECTRIC BULGARIA

KEMA

146-07

TYPE TEST CERTIFICATE OF SWITCHING PERFORMANCE

APPARATUS A three-phase three-position load break switch-disconnector for switch-fuse combination purpose in an SF_6-insulated metal-enclosed switchgear, type 8DJH

DESIGNATION 8DJH T **SERIAL No.** TR5

Rated voltage	24 kV (1)	Rated normal current	200 A
Rated short-circuit current	10 kA	Rated frequency	50 Hz

(1) See note on page 5.

MANUFACTURER Siemens AG, PTD M 2,
Frankfurt am Main, Germany

TESTED FOR Siemens AG, PTD M 2,
Frankfurt am Main, Germany

TESTED BY KEMA HIGH-POWER LABORATORY
Utrechtseweg 310 - 6812 AR Arnhem - The Netherlands

DATE(S) OF TESTS 1 and 2 November 2007

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in this Certificate, has been subjected to the series of proving tests in accordance with

IEC 60265-1, subclause 6.101 (Mainly active load current (100% and 5%), Cable-charging current (100% and 30%)

This Type Test Certificate has been issued by KEMA following exclusively the STL Guides.

The results are shown in the record of Proving Tests and the oscillograms attached hereto. The values obtained and the general performance are considered to comply with the above Standard(s) and to justify the ratings assigned by the manufacturer as listed on page 6.

The Certificate applies only to the apparatus tested. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

This Certificate consists of 206 sheets in total.

This Certificate falls under the scope of the accreditation certificate L 020 of the Dutch Council for Accreditation. See information sheet (page 2).

KEMA Nederland B.V.

P.G.A. Bus
KEMA T&D Testing Services
Managing Director

Arnhem, 13 February 2009

PS ELECTRIC BULGARIA

1 Certificate

A Certificate contains a record of a series of type tests carried out strictly in accordance with a recognized standard. The equipment tested has fulfilled the requirements of this standard and the relevant ratings assigned by the manufacturer are endorsed by KEMA. The Certificate is applicable only to the equipment tested. KEMA is responsible for the validity and the contents of the Certificate.
The responsibility for conformity of any apparatus having the same designation as the one tested rests with the manufacturer. The Certificate contains the essential drawings and a description of the equipment tested.
Detailed rules are given in KEMA's Certification procedure.

2 Report of Performance

A Report of Performance contains a record of one or more tests which have been carried out according to the client's instructions. These tests are not necessarily in accordance with a recognized standard. The test results do not verify ratings of the test object.

KEMA issues three types of Reports of Performance:

***2.1** The tests have been carried out strictly in accordance with .... The apparatus has complied with the relevant requirements.*

This sentence will appear on the front page of a Report of Performance if the tests have been performed in accordance with a recognized standard, but the series of tests does not completely fulfil the requirements for a Certificate of Compliance (for example, if the number of test duties is not a complete series of type tests). The Report contains verified drawings and a description of the equipment tested. Detailed rules are given in KEMA's Certification procedure. The condition of the test object after the tests is assessed and recorded in the Report.

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***2.3** The tests have been carried out according to the client's instructions.*

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5 Accuracy of measurement

In the table of test results the measured quantities are given in three digits. This method of presentation does not indicate an accuracy. The guaranteed uncertainty in the figures mentioned, taking into account the total measuring system, is less than 5%, unless mentioned otherwise.

6 Qualified by RvA (Dutch Council for Accreditation)

KEMA High-Power Laboratory and High-Voltage Laboratory have been entered in the RvA-register for laboratories under resp. Nrs. L 020 and L 218 for the testing services as defined in the Field of Accreditation.
The accreditation is carried out in accordance with ISO/IEC 17025.

TABLE OF CONTENTS:

ПС електрик ООД PS ELECTRIC BULGARIA

RATINGS ASSIGNED BY THE MANUFACTURER

Voltage	24 KV (1)	
Normal current	200 A	
Number of poles	3	
Frequency	50 Hz	X
Short-time withstand current	10 kA	
Peak withstand current	25 kA	
Duration of short-circuit	3 s	
Short-circuit making current	25 kA	
Mainly active load breaking current	200 A	X
Cable-charging breaking current	63 A	X
Pressure for interruption SF_6 at 20 °C	0,15 MPa	
Pressure for insulation SF_6 at 20 °C	0,15 MPa	
Supply voltage of closing and opening devices	24 Vd.c.	
Type of switch	backed by fuses	
Class	E3	X
Switch is only intended for use in solidly earthed systems.		

X = This rating has been proved by the tests of this Certificate.

(1) On request of the client, the tests have been based on a voltage of 25 kV.

DESCRIPTION OF APPARATUS TESTED

A three-phase three-position load break switch-disconnector for switch-fuse combination purpose in an SF_6-insulated metal-enclosed switchgear, type 8DJH

Minimum pressure for interruption at 20 °C	0,13 MPa
Maximum pressure for interruption at 20 °C	0,15 MPa

Mechanism:

Stored energy opening(springs, charged manually).
Stored energy closing (springs, charged manually).

Supply voltage closing coil	24 Vd.c.
Supply voltage opening coil	24 Vd.c.

TRAVEL RECORDER

Travel recorder attached to main contact shaft. Linear with contact travel.

ПС електрик ООД PS ELECTRIC BULGARIA

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 08117Fr-1 **Copy No.:** 0 **Contents:** 16 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH

Designation: Ring-main transformer panel block type RRT

Rated voltage:	24 kV	Rated normal current:	630A / 180A	1)	Rated frequency:	50 Hz / 60 Hz	
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21kA		Rated duration of short-circuit:	3 s	

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 20 to 24 September 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6	DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6
IEC 60265-1: 1998-11, clause 6.102	DIN EN 60265-1 (VDE 0670 Teil 301): 1999-05, Abschnitt 6.102
IEC 62271-102: 2003-08 clause 6.102	DIN EN 62271-102 (VDE 0671 Teil 102): 2004-10, Abschnitt 6.102

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Mechanical operation test"

1000 On-Off operations with the switch-disconnector of ring-cable feeder R1 for class M1
1000 Earth-Off operations with the make proof earthing switch of ring-cable feeder R1
1000 On-Off operations with the switch-disconnector of transformer feeder T1 for class M1
1000 Earth-Off operations with the make proof earthing switch of transformer feeder T1

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 11 March 2009

DAT-P-013/92-54

Notes

Accreditation

The PEHLA-Testing Laboratory Frankfurt am Main has been approved by the DATech (German accreditation body for technology) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. DAT-P-013/92-54).

STL-Member

PEHLA is founder member of the SHORT-CIRCUIT TESTING LIAISON (STL) which has been established in 1969. STL is a forum for the international cooperation of the testing organisations with the further full members ASTA (UK), CESI (IT), CPRI (IND), ESEF (FR), KEMA (NL), SATS (NO, SE, FI), STLNA (US, CA) and JSTC (JP). In the frame-work of EC, STL (EU) has been recognised in 1992 by EOTC as agreement group.

PEHLA-Documents

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Uncertainty of the measurement systems

The PEHLA - Testing Laboratories apply the PEHLA Guide No. 12 for determining the uncertainties of measurement, based on ENV 13005 (Guide to the expression of uncertainty in measurement). As long as no explicit statements are made, the uncertainties required by the relevant standards have been complied with.

Addresses

Office:	PEHLA-Geschäftsstelle Hallenweg 40 68219 Mannheim Germany Internet: www.pehla.com
Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Manufacturer:	Siemens AG Energy Sector E D MV Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Client:	Siemens AG Energy Sector E D MV 2 Carl-Benz-Straße 22 60386 Frankfurt am Main Germany

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 08117Fr-3 **Copy No.:** 0 **Contents:** 15 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH

Designation: Ring-main transformer panel block type RRT

Rated voltage:	24 kV	Rated normal current:	630 A / 180 A 1)	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 20 to 24 September 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6	DIN EN 62271-200 (VDE 0671 Teil 200): 2004-09, Abschnitt 6
IEC 62271-105: 2002-08, clause 6.102	DIN EN 62271-105 (VDE 0671 Teil 105): 2003-12, Abschnitt 6.102

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Mechanical operation tests"

The test of the trip linkages at the switch-fuse-combination was made with 100 operating cycles on the transformer feeder T1 as follows:

- 30 breaking operations with a striker of minimum energy (0,5 J) in phase L1
- 30 breaking operations with a striker of minimum energy (0,5 J) in phase L2
- 30 breaking operations with a striker of minimum energy (0,5 J) in phase L3
- 10 breaking operations with three strikers of maximum energy (1,5 J) simultaneously in phases L1, L2 and L3.

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 17 March 2009

DS ELECTRIC BULGARIA

Deutsche Akkreditierungs Rat

DAR

DAT-P-013/92-54

Notes

Accreditation

The PEHLA-Testing Laboratory Frankfurt am Main has been approved by the DATech (German accreditation body for technology) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. DAT-P-013/92-54).

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PEHLA-Documents

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is issued immediately after the tests. It confirms that the tests have been conducted and is valid only until publishing the detailed results in an entire document.

Uncertainty of the measurement systems

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Testing Station:	PEHLA-Testing Laboratory Frankfurt am Main Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Manufacturer:	Siemens AG Energy Sector E D MV Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Client:	Siemens AG Energy Sector E D MV 2 Carl-Benz-Straße 22 60386 Frankfurt am Main Germany

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 08117Fr-2 **Copy No.:** 0 **Contents:** 16 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH

Designation: Ring-main transformer panel block type RRT

Rated voltage:	24 kV	Rated normal current:	630 A / 180 A 1)	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 20 - 24 September 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.102

DIN EN 62271-200 (VDE 0671 Teil 200): 2004-09, Abschnitt 6.102

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Mechanical operation tests"

1. Switching devices and removable parts.
   The three-position switches of ring-main feeder R1 and transformer feeder T1 were operated 50 times.
2. Interlocks.
   The mechanical interlocks between three-position disconnector, "feeder" locking device (padlock) and cover of the cable compartment of ring-main feeder R1 and transformer feeder T1 were tested 50 times.

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 16 March 2009

DAT-P-013/92-54

Notes

Accreditation

The PEHLA-Testing Laboratory Frankfurt am Main has been approved by the DATech (German accreditation body for technology) according to EN ISO/IEC 17025 for tests in the field of high-voltage switchgear and controlgear and power engineering equipment (Registration-No. DAT-P-013/92-54).

STL-Member

PEHLA is founder member of the SHORT-CIRCUIT TESTING LIAISON (STL) which has been established in 1969. STL is a forum for the international cooperation of the testing organisations with the further full members ASTA (UK), CESI (IT), CPRI (IND), ESEF (FR), KEMA (NL), SATS (NO, SE, FI), STLNA (US, CA) and JSTC (JP). In the framework of EC, STL (EU) has been recognised in 1992 by EOTC as agreement group.

PEHLA-Documents

A Type Test Certificate

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Uncertainty of the measurement systems

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Office:
PEHLA-Geschäftsstelle
Hallenweg 40
68219 Mannheim
Germany
Internet: www.pehla.com

Testing Station:
PEHLA-Testing Laboratory
Frankfurt am Main
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

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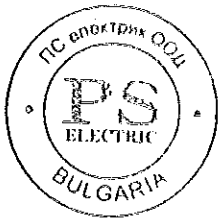

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Confirmation

Report No.: 08120Fr-0 **Copy No.:** 0 **Contents:** 2 Sheets

Test object: Gas - Insulated Switchgear Type 8DJH

Designation: Ring-main transformer panel block type RRT

Rated voltage:	24 kV	Rated normal current:	630 A / 180 A	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse.

Serial No.: TM 4
Drawing No.: 500-8004.9

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 24 September 2008

Applied test specifications:

IEC 62271-102: 2003-08 clause 6.105
DIN EN 62271-102: 2003-10 (VDE 0671 Teil 102) Abschnitt 6.105

Tests performed:

Type test „Tests to verify the proper function of the position-indicating device"
The tests were carried out on the transformer feeder T1

- Test on the power resp. position-indicating kinematic chain of the disconnector with independent manual operation
- Test on the power resp. position-indicating kinematic chain of the earthing-switch with independent manual operation

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

Detailed results will be documented in a separate document.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Boettcher Stommel

Observers of the test
Representatives of Technical Committee

Frankfurt am Main, 24 September 2008

50PE0804

Deutscher Akkreditierungs Rat
DAR
DAT-P-013/92-54

Notes

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Energy Sector
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60386 Frankfurt am Main
Germany

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PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 08122Fr-1 **Copy No.:** 0 **Contents:** 13 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH

Designation: Ring-main transformer panel block type RRT

Rated voltage:	24 kV	Rated normal current:	630 A / 180 A 1)	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 23 September 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.7.1	DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6.7.1
IEC 62271-1: 2007-10, clause 6.7.1	DIN IEC 62271-1 (VDE 0671 Teil 1) Entwurf: 2004-12, Abschnitt 6.7.1
IEC 60529: 2003-01	DIN EN 60529 (VDE 0470 Teil 1): 2000-09

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Verification of the IP coding"
Protection of the enclosure of the Ring-main transformer panel block type RRT against access to hazardous parts and protection against solid foreign objects, degree of protection IP3X.

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 20 March 2009

DAR Deutscher Akkreditierungs Rat DAT-P-013/92-54

Notes

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PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 08121Fr **Copy No.:** 0 **Contents:** 12 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH

Designation: Ring-main transformer panel block type RRT

Rated voltage:	24 kV	Rated normal current:	630 A / 180 A	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 12 and 23 September 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.8	DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6.8
IEC 62271-1: 2007-10, clause 6.8	DIN IEC 62271-1 (VDE 0671 Teil 1) Entwurf: 2004-12, Abschnitt 6.8

According to STL Objectives and Operating Principles PEHLA Issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type test "Tightness tests before and after mechanical operation test"

1. Tightness test of gas-filled compartment before the mechanical operation test
2. Mechanical operation tests with the ring-cable feeder R1 and R2 and with the transformer feeder T1 (1000 CLOSE - OPEN and 1000 EARTHED - OPEN operations)
3. Tightness test of gas-filled compartment after the mechanical operation test

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 04 February 2009

DAT-P-013/92-54

Notes

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Manufacturer:	Siemens AG Energy Sector E D MV Carl-Benz-Straße 22 60386 Frankfurt am Main Germany
Client:	Siemens AG Energy Sector E D MV 2 Carl-Benz-Straße 22 60386 Frankfurt am Main Germany

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 0879Fr **Copy No.:** 0 **Contents:** 9 **Sheets**

Test object: Gas – Insulated Switchgear Type 8DJH

Designation: Switchgear vessel of the transformer panel type T

Rated voltage:	up to 24 kV	Rated normal current:	180 A 1)	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	up to 62,5 kA	Rated short-time withstand current:	up to 25 kA	Rated duration of short-circuit:	up to 3 s

1) The rated normal current of the transformer depends on the type of the HV HRC fuse.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 30 October 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.103

DIN EN 62271-200: 2004-10 (VDE 0671 Teil 200), Abschnitt 6.103

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type Test "Pressure withstand test for gas-filled compartments with pressure relief devices"

- The relative pressure was increased up to 110 kPa in order to reach a value of 1,3 times the design pressure of 85 kPa of the compartment for a period of 1 min. The pressure relief device did not operate.
- Then the pressure should have been increased up to a maximum value of 255 kPa (e.g. 3 times the design pressure of 85 kPa). The pressure relief device operated, as designed by the manufacturer, below this value. The reached opening overpressure was 227 kPa.

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

i. V.

Technical Committee

Mannheim, 03 November 2008

Deutscher Akkreditierungs Rat
DAR
DAT-P-013/92-54

Notes

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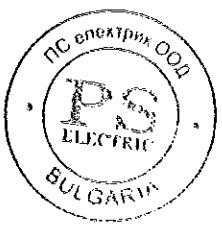

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 0883Fr **Copy No.:** 0 **Contents:** 24 **Sheets**

Test object: Gas - Insulated Switchgear Type 8DJH
consisting of transformer panel type -T- and cable panel type -K-

Designation: Transformer panel type -T-

Rated voltage:	24 kV	Rated normal current:	630 A / 180 A	1 Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA	Rated short-time withstand current:	21 kA	Rated duration of short-circuit:	3 s

1) The rated normal current of the transformer feeder depends on the type of the HV HRC fuse.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Frankfurt am Main

Date of test: 23 July 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.106

DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6.106

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type Test "Internal arcing test" of the gas filled compartment

Testing under conditions of arcing due to an internal fault according classification IAC AFLR 21 kA 1 s.

Three-phase arc initiation within the switchgear vessel with a peak current of I_p = 54,0 kA and a short-circuit current of I_k = 21,7 kA – 1,00 s (I_k = 21,0 kA – 1,03 s accordingly).

(Continued on sheet 3)

Test results:

The assessment of the effects under condition of arcing due to an internal fault corresponding to the criteria 1 to 5 of the above mentioned test specification is compiled on sheet 3.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN – PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

Management Committee

Technical Committee

Mannheim, 18 August 2008

ETC енергия ООД ELECTRIC BULGARIA

Deutscher Akkreditierungs Rat DAR

DAT-P-013/92-54

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Manufacturer: Siemens AG
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E D MV
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Client: Siemens AG
Energy Sector
E D MV 2
Carl-Benz-Straße 22
60386 Frankfurt am Main
Germany

Test performed

(Continuation from sheet 1)

The test on the medium voltage switchgear was performed for accessibility type A (restricted to authorized personal only).

The test of the free-standing panel took place in a room mock-up with an effective ceiling height of 2,00 m. The distance between the rear wall of the switchgear and the room mock-up was 0,80 m, between the top of the switchgear and the ceiling of the room mock-up was 0,60 m and between the right lateral wall and the room mock-up was 0,10 m.

Vertical indicators were arranged at a distance of 0,30 m.
The Indicators were arranged at three sides of the switchgear (front, left lateral and rear side), covering 40% to 50% of the area.

The three-phase infeeding of the current was in the cable connection compartment of cable panel type -K- via cables 240 mm^2.

Three-phase arc initiation was at the frontside fuse bushings within the gas filled compartment.

The pressure relief effected downwards into the cable basement mock-up.

The opening for the manual operation for the mechanism of the load-break switch function was in open position.

Test results

(Continuation from sheet 1)

Test-no. 0883Fr / 03

Criteria according to IEC 62271-200		fulfilled (yes/no)
No.1:	Correctly secured doors and covers do not open	yes
No.2:	No fragmentation of the enclosure occurs and no parts more than 60 g flow away	yes
No.3:	Arcing does not cause holes in the accessible sides up to a height of 2 m	yes
No.4:	Indicators do not ignite due to the effect of hot gases	yes
No.5:	The enclosure remains connected to its earthing point	yes

Test results: The test has been passed.

Achieved class of the gas filled compartment: IAC AFLR 21 kA 1 s.

PEHLA

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN
Member of the SHORT-CIRCUIT TESTING LIAISON (STL)

Test Document

Report No.: 0813Bm Copy No.: 1 Contents: 22 Sheets

Test object: Gas-insulated switchgear type 8DJH,
consisting of transformer panel type -T- and cable panel type -K-

Designation: Transformer panel type -T-

Rated voltage:	24 kV	Rated normal current:	180 A 1)	Rated frequency:	50 Hz / 60 Hz
Rated peak withstand current:	52,5 kA / 54,6 kA 2)	Rated short-time withstand current:	21 kA 2)	Rated duration of short-circuit:	3 s 2)

1) The rated normal current of the transformer panel depends on the type of the HV HRC fuse.
2) The peak withstand current, the short-time withstand current and the duration of short-circuit is limited by the type of the HV HRC fuse.

Manufacturer: Siemens AG, E D MV

Client: Siemens AG, E D MV 2

Testing station: PEHLA-Testing Laboratory Berlin-Marzahn

Date of test: 13 August 2008

Applied test specifications:

IEC 62271-200: 2003-11, clause 6.106

DIN EN 62271-200 (VDE 0671 Teil 200): 2004-10, Abschnitt 6.106

According to STL Objectives and Operating Principles PEHLA issues a Test Document following exclusively the above mentioned standards and the STL Guides wherever applicable.

Tests performed:

Type Test "Internal arcing test" of the fuse-protected cable compartment
Testing under conditions of arcing due to an internal fault according classification
IAC AFLR 21 kA 1 s.
Two-phase arc initiation at the bushings with plug-in contact of phase L1 and L2 within the cable connection compartment with inserted HV HRC fuse type Siemens 3GD1 420-4D (24 kV / 100 A) with a peak current of I_p = 45,8 kA and a short-circuit current of I_k = 18,3 kA – 1,00 s at a test voltage of 24 kV (I_k = 18,3 kA = 21 kA x 0,87 – 1,00 s accordingly).
(Continued on sheet 3)

Test results:

The above mentioned test object has passed the tests performed in accordance with the applied test specifications.

GESELLSCHAFT FÜR ELEKTRISCHE HOCHLEISTUNGSPRÜFUNGEN

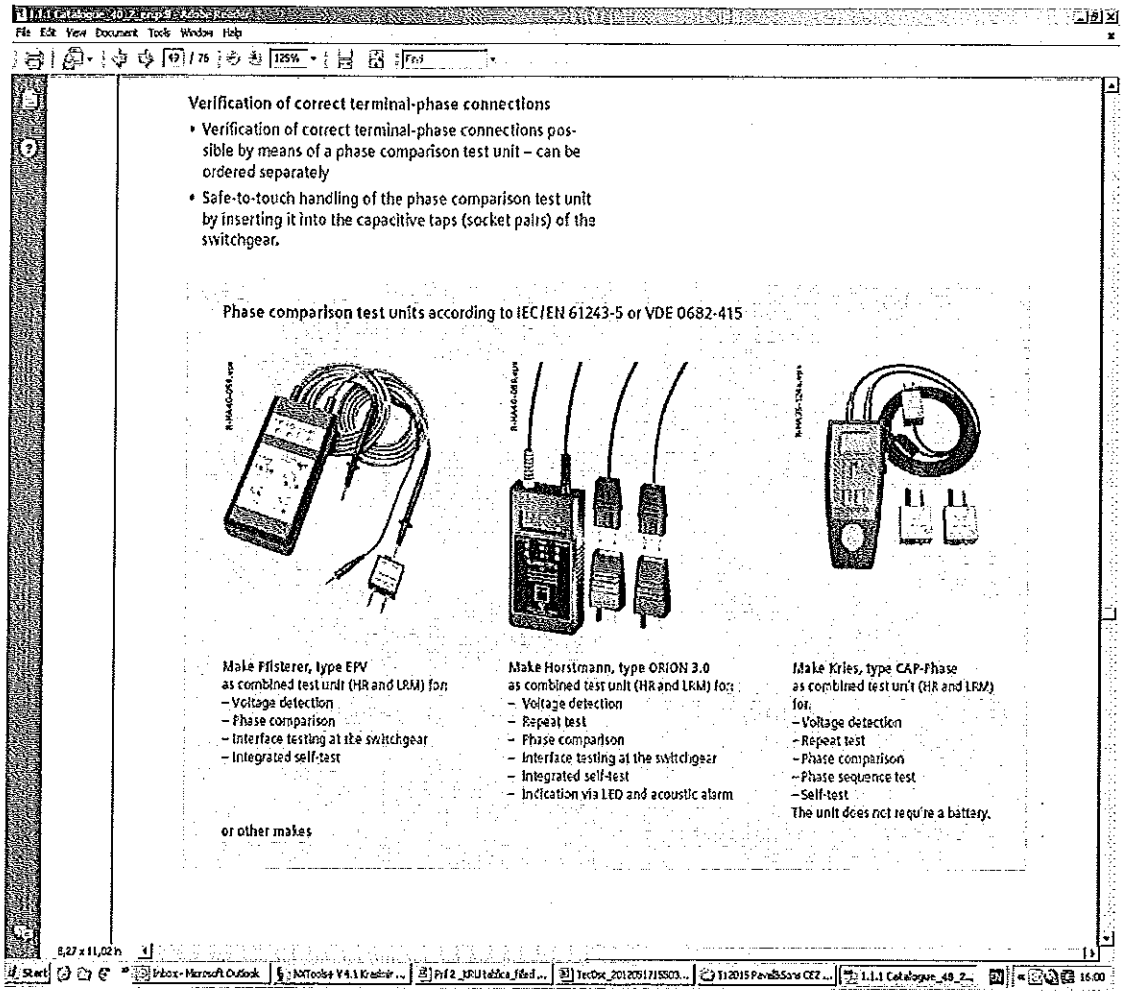
Management Committee

Technical Committee

Mannheim, 25 März 2009

Deutscher Akkreditierungs Rat
DAR
DAT-P-019/92-63

Приложение 4.2



Verification of correct terminal-phase connections

- Verification of correct terminal-phase connections possible by means of a phase comparison test unit – can be ordered separately
- Safe-to-touch handling of the phase comparison test unit by inserting it into the capacitive taps (socket pairs) of the switchgear.

Phase comparison test units according to IEC/EN 61243-5 or VDE 0682-415

Make Pfisterer, type EPV
as combined test unit (HR and LRM) for:
– Voltage detection
– Phase comparison
– Interface testing at the switchgear
– Integrated self-test

Make Horstmann, type ORION 3.0
as combined test unit (HR and LRM) for:
– Voltage detection
– Repeat test
– Phase comparison
– Interface testing at the switchgear
– Integrated self-test
– Indication via LED and acoustic alarm

Make Kries, type CAP-Phase
as combined test unit (HR and LRM) for:
– Voltage detection
– Repeat test
– Phase comparison
– Phase sequence test
– Self-test
The unit does not require a battery.

or other makes

Устройство за сфазиране

1.Kries CAPA - Germany type CAP Phase
2.Цена - поръчка заедно с КРУ
3.Доставка - до 6 седмици

ПС ЕЛЕКТРИК ООД
PS ELECTRIC
BULGARIA

Приложение 48

SIEMENS

TÜVRheinland

СЕРТИФИКАТ ЗА КАЧЕСТВО И СЪОТВЕТСТВИЕ

С настоящото потвърждаваме, че комплектна разпределителна уредба за средно напрежение тип 8DJH, е производство на SIEMENS AG.

Оборудването е проектирано, произведено и изпитано съгласно актуалните IEC и VDE/ISO стандарти.

Данни за продукта:

Наименование: Комплектна разпределителна уредба за средно напрежение (КРУ):

- Тип — 8DJH
- Производство по СК — ISO 9001 : 2008; ISO 14001:2004
- Рег. No. на сертификата — 125409-2012-AHSO-GER-TGA
- Валидност — 20.12.2015
- Съответствие с IEC и EN стандарти: **62271-1 (предишен 60 694); 62 271-200; 62 271-100; 62 271-102; 62 265-1; 62 271-105; 61 243-5; 60 282-1; 60 529; 61 936-1; 60 044-1; 60 044-2; 60 071;HD 637-S1**

Заключение: Оборудването е типово изпитано и подлежи на рутинни изпитания преди експедиция от завода производител и отговаря на световните стандарти.

ИЗДАВА

Направление: IC LMV – СИМЕНС ЕООД

Инж. Таньо Караиванов
/Мениджър IC LMV/

СИМЕНС ЕООД СОФИЯ

ПС електрик ООД PS ELECTRIC BULGARIA

Приложение 49

ПРИЛОЖЕНИЕ № 1

"ЕЛПРОМ ЕМЗ" ООД град ШАБЛА

ТЕЛЕФОНИ ЗА КОНТАКТИ :
Управител 05743 / 45 - 68
Пласмент 05743 / 42 - 84
Факс/тел.секретар 05743 / 50 - 20
www: elpromemz.dir.bg
E-mail : elpromemz@mbox.infotel.bg

ФИРМЕН ПРОФИЛ
НА " ЕЛПРОМ ЕМЗ " ООД град ШАБЛА

ОБЩА ИНФОРМАЦИЯ ЗА „ ЕЛПРОМ ЕМЗ " ООД град Шабла:

" ЕЛПРОМ ЕМЗ " ООД град Шабла е регистрирано по ф.д. № 481/1991 година при Добрички окръжен съд като правоприемник на ДФ " Елпром София и ДФ " Елпром АВН " град Добрич.

ПРОИЗВОДСТВО : " ЕЛПРОМ ЕМЗ " ООД град Шабла има за свой предмет на дейност :

1.*Производство и реализация на токови измерителни трансформатори* за НН до 1 кV и СрН до 24 кV за вътрешен монтаж с клас на точност 0.2; 0.2S; 0.5; 0.5S и 5P10 и номинална мощност до 50VA в диапазона от номинални токове от 5/5/5A до 3000/5/5A съгласно БДС EN 60044-1:2001 и IEC 60044-1:1999. Произвеждат се следните типове токови измервателни трансформатори:

1. тип СТ-1; тип СТ-2; тип СТ-3; тип СТ-4 са с най-високо работно напрежение до 1 кV
2. тип 7.2СТ-1;тип 7.2СТ-2; тип 7.2СТ-3 са с най-високо работно напрежение до 7.2 кV.
3. тип 7.2СТ-1 PR; тип 7.2СТ-2 PR; тип 7.2СТ-3 PR – трансформатори с външно превключване на първичната намотка с най-високо работно напрежение до 7.2 кV.
4. тип 12СТ-1; тип 12СТ-2; тип 12СТ-3 - са с най-високо работно напрежение до 12 кV.
5. тип 12СТ-1 PR; тип 12СТ-2 PR; тип 12СТ-3 PR – трансформатори с външно превключване на първичната намотка с най-високо работно напрежение до 12 кV.
6. тип 24СТ-1; тип 24СТ-2; тип 24СТ-3 - са с най-високо работно напрежение до 24 кV.
7. тип 24СТ-1 PR; тип 24СТ-2 PR; тип 24СТ-3 PR – трансформатори с външно превключване на първичната намотка с най-високо работно напрежение до 24 кV.

" ЕЛПРОМ ЕМЗ " ООД ГРАД ШАБЛА Е ЕДИНСТВЕНИЯТ ПРОИЗВОДИТЕЛ НА ТОКОВИ ИЗМЕРВАТЕЛНИ ТРАНСФОРМАТОРИ НА ТЕРИТОРИЯТА НА РЕПУБЛИКА БЪЛГАРИЯ.

08.2.2012 г.

2. *През 2002 година започнахме да произвеждаме ТОКОВИ ТРАНСФОРМАТОРИ ТИП " ФЕРАНТИ " за номинално напрежение до 24 KV и честота 50 Hz за вътрешен монтаж на кабели.*

Произвеждаме три типа трансформатори :
Тип FER-1 за монтаж на кабел с диаметър до 30 мм ;
Тип FER-2 за монтаж на кабел с диаметър до 40 мм ;
Тип FER-3 за монтаж на кабел с диаметър до 80 мм.

3. *През 2002 година започнахме да произвеждаме също и БЪРЗОНАСИЩАЩИСЕ ТОКОВИ ТРАНСФОРМАТОРИ ТИП SBP-1 за номинално работна напрежение до 24 KV и честота 50 Hz за вътрешен монтаж използвани в релейните защити.*

4. *"ЕЛПРОМ ЕМЗ " ООД ГРАД ШАБЛА ПРОИЗВЕЖДА ГАМА ЕДНОФАЗНИ МАСЛЕНИ ТРАНСФОРМАТОРИ ЗА СТЪЛБОВ МОНТАЖ* Тип 1TM20/□3/0.23–20Cu и Тип 2TM20/20/0.23-Cu с номинални мощности съответно 0.5 кVA, 1 кVA 2 кVA, 5 кVA, 10 кVA, 16 кVA, 20 кVA, 25 кVA, 40 кVA и 50 кVA , номинално работно напрежение на намотка ВН 20 кV и с номинално работно напрежение на намотка НН 0.23 кV. Предназначен за използване в енергийните системи, като понижаващ трансформатор, за захранване на мрежи НН с общо предназначение

МОНТАЖ НА ТРАНСФОРМАТОРА : Трансформаторите са пригодени за открит стълбов монтаж. Трансформаторът може да бъде монтиран или на предварително подготвена площадка закрепена на метален решетъчен стълб или направо върху бетонният или дървен стълб. Закрепването в този случай към стълба става посредством две метални скоби, предвидено е закрепващите скоби взависимост от диаметъра на стълба да се регулират в рамките на диаметър от 80 до 330 мм.

КЪМ ГАМА МОНОФАЗНИ МАСЛЕНИ ТРАНСФОРМАТОРИ Тип 1TMxx/□3/0.23–20Cu и Тип 2TMxx/20/0.23–Cu при желание на КЛИЕНТА ПРЕДЛАГАМЕ – еднофазен или двуфазен разединител за открит стълбов монтаж от серията РОМ за номинално напрежение 20 кV и номинален ток 200А, окомплектовани с хибридна стойка за високоволтови предпазители за открит монтаж на 20 кV и с катодни отводнители за 20 кV 10кА в комплект с високоволтови предпазители за напрежение 20 кV и РЛЗ.

Имаме разработка на АВТОМАТИЧЕН СТЪПАЛЕН РЕГУЛАТОР НА НАПРЕЖЕНИЕ към ГАМАТА ЕДНОФАЗНИ МАСЛЕНИ ТРАНСФОРМАТОРИ ЗА СТЪЛБОВ МОНТАЖ Тип 2TM20/20/0.23-Cu, който гарантира стабилно изходно напрежение 220 V при колебание на входното напрежение 20кV в границите на –20% до +10%.

5.*"ЕЛПРОМ ЕМЗ"ООД гр. ШАБЛА извършва цялостен или частичен основен ремонт на силови маслени високоволтови трансформатори с мощност от 25 KVA до 1250 KVA включително на 20 KV, 10 KV или 6 KV.*

От 2000 година " ЕЛПРОМ ЕМЗ " ООД град Шабла започна да предлага за продажба на клиенти свои налични заводски рециклирани трифазни силови, маслени, високоволтови трансформатори с мощност от 160 KVA до 1000 KVA на 20 KV, 10 KV и на 6 KV , като дава 12 месеца гаранция на продаваните трансформатори.

През 2003 година " ЕЛПРОМ ЕМЗ " ООД град Шабла започна да поизвежда и да продава НОВИ трифазни, силови, маслени, високоволтови трансформатори с мощност от 25 KVA до 100 KVA на 20 KV, 10 KV или на 6 KV, като дава 18 месеца гаранция на продаваните трансформатори.

Произвеждат се следните мощности /25, 40, 50, 63, 100 KVA/.

6. ***" ЕЛПРОМ ЕМЗ " ООД град Шабла произвежда сухи трансформатори*** за електрозадвижване с високомоментни постоянно - токови двигатели с номинална мощност от 0.25кVA до 20 кVA отговарящи на изискванията на ОН 0470427-84, те са комплектовъчни изделия в електрозадвижвания с високомоментни постояннотокови двигатели, които се използват в металорежещите машини, робототехниката и други.

7. ***" ЕЛПРОМ ЕМЗ " ООД град Шабла произвежда монофазни и трифазни дросели с ВЪЗДУШНА МЕЖДИНА*** и номинална мощност до 400kWAR , които са комплектовъчни изделия в уредбите за компенсиране на cosφ. Произвеждат се и дросели с номинална индуктивност до 1.5 Н и номинален ток до 100 А отговарящи на изискванията на ОН 0477415-87, които са комплектовъчни изделия за електрозадвижвания с високомоментни постояннотокови двигатели за задвижване на металорежещи машини, роботи и други.

8. ***"ЕЛПРОМ ЕМЗ " ООД град Шабла произвежда трансформатори еднофазни и трифазни изпълнени*** по заявка или по заявка и конструктивна документация на клиента отговарящи на нормативни документи посочени от клиента.

УПРАВИТЕЛ :
/ инж.Д.Арнаудов /

ЕЛПРОМ • ЕМЗ • ООД • ШАБЛА •

ПС електрик ООД
PS ELECTRIC
BULGARIA

Приложение 50
Приложение: 2

РЕПУБЛИКА
БЪЛГАРИЯ

ДЪРЖАВНА АГЕНЦИЯ ЗА МЕТРОЛОГИЯ И ТЕХНИЧЕСКИ НАДЗОР
STATE AGENCY FOR METROLOGY AND TECHNICAL SURVEILLANCE

УДОСТОВЕРЕНИЕ
ЗА ОДОБРЕН ТИП СРЕДСТВО ЗА ИЗМЕРВАНЕ
Measuring Instrument Type-approval Certificate

№ 06.04.4547

Издадено на: *Issued to:*	"ЕЛПРОМ-ЕМЗ" ООД, 9680 Шабла, обл. Добричка, ул. "Нефтяник" № 38
На основание на: *In Accordance with:*	чл. 32, ал. 1 от Закона за измерванията (ДВ, бр. 46 от 2002 г.)
Относно: *In Respect of:*	гама токови измервателни трансформатори, тип СТ-Х
Производител: *Manufacturer:*	"ЕЛПРОМ-ЕМЗ" ООД, гр. Шабла
Знак за одобрен тип: *Type Approval Mark:*	BG 06 4547
Технически и метрологични характеристики: *Technical and metrological characteristics:*	приложение, неразделна част от настоящото удостоверение за одобрен тип средство за измерване
Срок на валидност: *Valid until:*	03.04.2016 г.
Вписва се в регистъра на одобрените за използване типове средства за измерване под №: *Reference №:*	4547
Дата на издаване на удостоверението за одобрен тип: *Date:*	03.04.2006 г.

ПРЕДСЕДАТЕЛ:
К. Кавалджиев

ПС електрик ООД PS ELECTRIC BULGARIA

Страница 1 от 2

Вярно с оригинала

Приложение: 2

Приложение към удостоверение за одобрен тип № 06.04.4547

Издадено на: "ЕЛПРОМ-ЕМЗ" ООД, гр. Шабла

Относно: гама токови измервателни трансформатори, тип СТ-х

1. Описание на типа:

Токовите трансформатори тип СТ– х са предназначени за измерване на ток и за защита на разпределителни съоръжения (уредби) във вътрешно изпълнение.

Токовите трансформатори тип СТ– х се състоят от тороидален магнитопровод с първична и вторична намотка, поместени в кутия от пластмаса с клас на възпламеняемост съгласно IEC 707-V-0.

Изолацията спрямо магнитопровода и намотките е суха с клас на топлоустойчивост В.

Трансформаторите тип СТ–х са предназначени за експлоатация при надморска височина до 1000 m за закрит монтаж при температура на въздуха от минус 5° С до + 40° С и относителна влажност на въздуха до 70 % за условия на умерен климат.

1.1. Технически и метрологични характристики:

Номинален първичен ток, А	СТ – 1 СТ – 2 СТ – 3	30, 50, 75, 100, 150 200, 250, 300 400, 500, 600
Номинален вторичен ток, А		5
Клас на точност	СТ – 1 СТ – 2 СТ – 3	0,2; 0,5 0,5 0,5
Коефициент на безопасност - Fs		5, 10
Номинална мощност, VA	СТ – 1 СТ – 2 СТ – 3	5, 10 5, 10 5, 10, 15
Максимално работно напрежение, kV		0,72

Забележка: * Номиналната мощност 10 VA не се отнася за трансформатори с токово отношение 150/5 А.

1.2. Означаване на типа:

Означението на типа е СТ-х (СТ-1, СТ-2 и СТ-3).

Параметрите като клас наточност, първичен ток, вторичен ток, номинално напрежение и коефициент на сигурност са посочени на табелката на трансформатора.

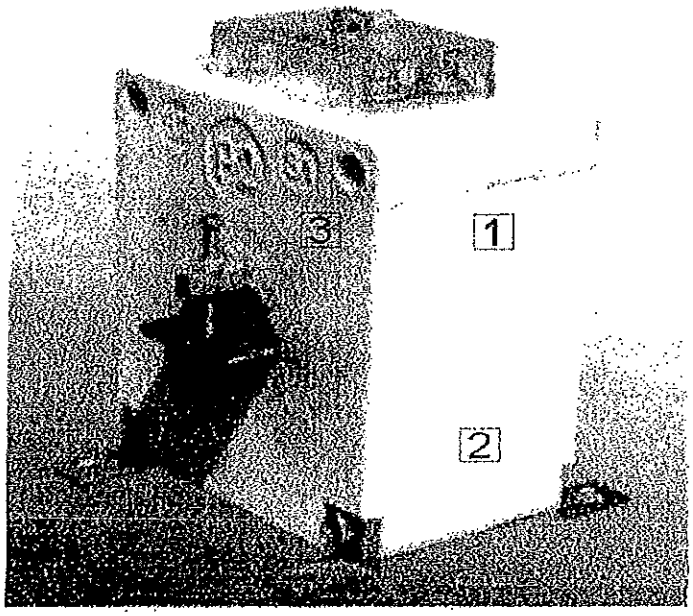
ЕЛПРОМ-ЕМЗ ШАБЛА ПС електрик ООД PS ELECTRIC BULGARIA

Вярно с оригинала

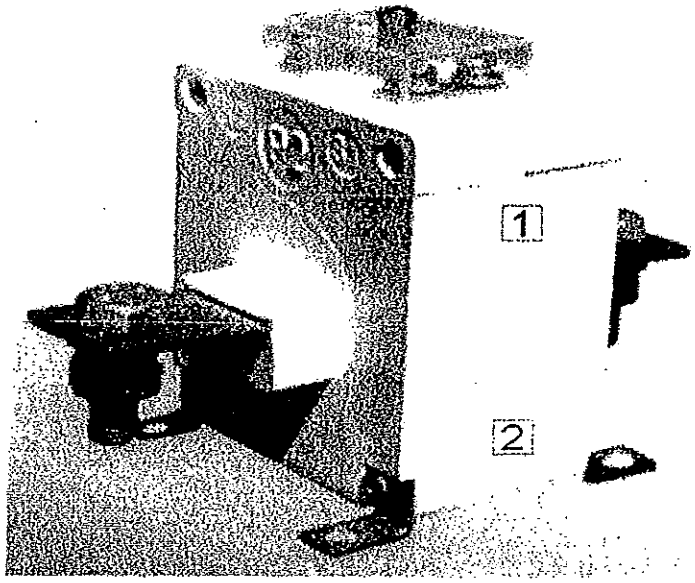
Приложение: 2

Приложение към удостоверение за одобрен тип № 06.04.4547

2. Схеми на местата за поставяне на знаците, удостоверяващи резултатите от контрола и места за пломбиране.



1 – Знак за първоначална проверка (марка за залепване)
2 – Знак за последваща проверка (марка за залепване)
3 – Знак за одобрен тип



1 – Знак за първоначална проверка (марка за залепване)
2 – Знак за последваща проверка (марка за залепване)
3 – Знак за одобрен тип

ПС електрик ООД
ЕЛЕКТРОМ•ЕМ3•ШАЛКА•ООД

Вярно с оригинала

Приложение: 2

БЪЛГАРСКИ ИНСТИТУТ ПО МЕТРОЛОГИЯ

BULGARIAN INSTITUTE OF METROLOGY

РЕПУБЛИКА
БЪЛГАРИЯ

ДОПЪЛНЕНИЕ № 06.07.4547.1

КЪМ УДОСТОВЕРЕНИЕ ЗА ОДОБРЕН ТИП СРЕДСТВО ЗА ИЗМЕРВАНЕ № 06.04.4547

Measuring Instrument Type-approval Certificate-Revision 1

Издадено на: *Issued to:*	"ЕЛПРОМ-ЕМЗ" ООД, 9680 Шабла, обл. Добричка, ул. "Нефтяник" № 38
На основание на: *In Accordance with:*	чл. 32, ал. 1 от Закона за измерванията (ДВ, бр. 46 от 2002 г.)
Относно: *In Respect of:*	токов измервателен трансформатор, тип СТ-х
Производител: *Manufacturer:*	"ЕЛПРОМ-ЕМЗ" ООД, гр. Шабла
Технически и метрологични характеристики: *Technical and metrological characteristics:*	приложение, неразделна част от настоящото удостоверение за одобрен тип средство за измерване.
Срок на валидност: *Valid until:*	03.04.2016 г.
Средството за измерване е вписано в регистъра на одобрените за използване типове средства за измерване под №: *Reference №:*	4547
Дата на издаване на допълнението към удостоверението за одобрен тип: *Date:*	17.07.2006 г.

РЕПУБЛИКА БЪЛГАРИЯ
БЪЛГАРСКИ ИНСТИТУТ ПО МЕТРОЛОГИЯ 2

ЗА ПРЕДСЕДАТЕЛ:
К. Катеринов

ПС електрик ООД

Копие с оригинала

Приложение: 2

Приложение към Допълнение № 06.07.4547.1 към удостоверение № 06.04.4547

Издадено на: "ЕЛПРОМ-ЕМЗ" ООД, гр. Шабла

Относно: токов измервателен трансформатор, тип СТ-х

Описание на допълнението

1. Към т. 1 Описание на типа, се добавя:

Токовите трансформатори с клас на точност 0,5 S са за специални цели. Свързват се с електромери, които измерват стойности на тока между 50 mA и 6 A, което е от 1 % до 120 % от номиналния ток на трансформатора – 5 A.

Токовата и ъгловата грешка при 1 % от номиналния ток не превишават стойностите, посочени в стандарт БДС EN 60044-1:2001.

2. Към т. 1.1 Технически и метрологични характеристики:

2.1 Включва се токов измервателен трансформатор тип СТ-4 със следните метрологични характеристики:

Номинален първичен ток, A	750, 800, 1000, 1200, 1250 и 1500
Номинален вторичен ток, A	5
Клас на точност	0,5 и 0,5 S
Коефициент на безопасност – Fs	5, 10
Номинална мощност, VA	5, 10 и 15
Максимално работно напрежение, kV	0,72

2.2 Включва се клас на точност 0,5 S за трансформатори тип СТ-1, тип СТ-2 и тип СТ-3;

2.3 Отпада забележката.

ПС електрик ООД PS ELECTRIC ЕЛПРОМ-ЕМЗ ШАБЛА

Вярно с оригинала